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IBM Mobile Systems
ThinkPad Computer
Hardware Maintenance Manual

January 2004

This manual supports:

**ThinkPad X30, X31
(MT 2672/2673/2884/2885/2890/2891)
ThinkPad Dock (MT 2631)
ThinkPad Dock II (MT 2877)**

Note

Before using this information and the product it supports, be sure to read the general information under “Notices” on page 183.

First Edition (January 2004)

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About this manual

This manual contains service and reference information for IBM ThinkPad X30, X31 (MT 2672, 2673, 2884, 2885, 2890, 2891), ThinkPad Dock (MT 2631), and ThinkPad Dock II (MT 2877) products. Use this manual along with the advanced diagnostic tests to troubleshoot problems.

The manual is divided into sections as follows:

- The common sections provide general information, guidelines, and safety information required in servicing computers.
- The product-specific section includes service, reference, and product-specific parts information.

Important

This manual is intended for trained service personnel who are familiar with ThinkPad products. Use this manual along with the advanced diagnostic tests to troubleshoot problems effectively.

Before servicing an IBM ThinkPad product, be sure to review the safety information under “Safety notices: multilingual translations” on page 4, “Safety information” on page 16, and “Laser compliance statement” on page 22.

Introduction

Important service information

Important

BIOS and device driver fixes are customer-installable. The BIOS and device drivers are posted on the IBM support site
<http://www.ibm.com/pc/support>

Advise customers to contact the PC Company HelpCenter at 800-772-2227 if they need assistance in obtaining or installing any diskette fixes.

Customers in Canada should call IBM HelpPC at 800-565-3344 for assistance or download information.

Strategy for replacing FRUs

Before replacing parts

Make sure that all diskette fixes are installed before replacing any FRUs listed in this manual.

Use the following strategy to prevent unnecessary expense for replacing and servicing FRUs:

- **If you are instructed to replace a FRU but the replacement does not correct the problem, reinstall the original FRU before you continue.**
- Some computers have both a processor board and a system board. If you are instructed to replace either the processor board or the system board, and replacing one of them does not correct the problem, reinstall that board, and then replace the other one.
- If an adapter or a device consists of more than one FRU, any of the FRUs may be the cause of the error. Before replacing the adapter or device, remove the FRUs, one by one, to see if the symptoms change. Replace only the FRU that changed the symptoms.

Attention: The setup configuration on the computer you are servicing may have been customized. Running Automatic Configuration may alter the settings. Note the current configuration settings (using the View Configuration option); then, when service has been completed, verify that those settings remain in effect.

Strategy for replacing a hard disk drive

Always try to run a low-level format before replacing a hard disk drive.

Attention: The drive startup sequence in the computer you are servicing may have been changed. Be extremely careful during write operations such as copying, saving, or formatting. If you select an incorrect drive, data or programs can be overwritten.

How to use error messages

Use the error codes displayed on the screen to diagnose failures. If more than one error code is displayed, begin the diagnosis with the first error code. Whatever causes the first error code may also cause false error codes. If no error code is displayed, see whether the error symptom is listed in the Symptom-to-FRU Index for the computer you are servicing.

Diskette compatibility matrix

The compatibility of each of the drives with the diskettes for it is as follows:

Diskette drive	Diskette capacity	Compatibility
3.5-inch	1.0 MB	Read and write
	2.0 MB	Read and write
	4.0 MB	Not compatible

Safety notices: multilingual translations

In this manual, safety notices appear in English with a page number reference to the appropriate multilingual, translated safety notice found in this section.

The following safety notices are provided in English, French, German, Hebrew, Italian, and Spanish.

Safety notice 1

Before the computer is powered on after FRU replacement, make sure all screws, springs, and other small parts are in place and are not left loose inside the computer. Verify this by shaking the computer and listening for rattling sounds. Metallic parts or metal flakes can cause electrical shorts.

Avant de remettre l'ordinateur sous tension après remplacement d'une unité en clientèle, vérifiez que tous les ressorts, vis et autres pièces sont bien en place et bien fixées. Pour ce faire, secouez l'unité et assurez-vous qu'aucun bruit suspect ne se produit. Des pièces métalliques ou des copeaux de métal pourraient causer un court-circuit.

Bevor nach einem FRU-Austausch der Computer wieder angeschlossen wird, muß sichergestellt werden, daß keine Schrauben, Federn oder andere Kleinteile fehlen oder im Gehäuse vergessen wurden. Der Computer muß geschüttelt und auf Klappergeräusche geprüft werden. Metallteile oder-splitter können Kurzschlüsse erzeugen.

לפני הפעלת המחשב לאחר החלפת FRU יש לוודא שכל הברגים, הקפיצים, וחלקים קטנים אחרים נמצאים במקומם ואינם חופשיים לזוז בתוך המחשב. כדי לוודא זאת, יש לטלטל את המחשב ולהקשיב לגילוי קולות שקשוק. חלקי או שבבי מתכת עלולים לגרום לקצרים חשמליים.

Prima di accendere l'elaboratore dopo che é stata effettuata la sostituzione di una FRU, accertarsi che tutte le viti, le molle e tutte le altre parti di piccole dimensioni siano nella corretta posizione e non siano sparse all'interno dell'elaboratore. Verificare ciò scuotendo l'elaboratore e prestando attenzione ad eventuali rumori; eventuali parti o pezzetti metallici possono provocare cortocircuiti pericolosi.

Antes de encender el sistema despues de sustituir una FRU, compruebe que todos los tornillos, muelles y demás piezas pequeñas se encuentran en su sitio y no se encuentran sueltas dentro del sistema. Compruébelo agitando el sistema y escuchando los posibles ruidos que provocarían. Las piezas metálicas pueden causar cortocircuitos eléctricos.

Safety notice 2



Some standby batteries contain a small amount of nickel and cadmium. Do not disassemble a standby battery, recharge it, throw it into fire or water, or short-circuit it. Dispose of the battery as required by local ordinances or regulations. Use only the battery in the appropriate parts listing. Use of an incorrect battery can result in ignition or explosion of the battery.

Certaines batteries de secours contiennent du nickel et du cadmium. Ne les démontez pas, ne les rechargez pas, ne les exposez ni au feu ni à l'eau. Ne les mettez pas en court-circuit. Pour les mettre au rebut, conformez-vous à la réglementation en vigueur. Lorsque vous remplacez la pile de sauvegarde ou celle de l'horloge temps réel, veillez à n'utiliser que les modèles cités dans la liste de pièces détachées adéquate. Une batterie ou une pile inappropriée risque de prendre feu ou d'exploser.

Die Bereitschaftsbatterie, die sich unter dem Diskettenlaufwerk befindet, kann geringe Mengen Nickel und Cadmium enthalten. Sie darf nur durch die Verkaufsstelle oder den IBM Kundendienst ausgetauscht werden. Sie darf nicht zerlegt, wiederaufgeladen, kurzgeschlossen, oder Feuer oder Wasser ausgesetzt werden. Die Batterie kann schwere Verbrennungen oder Verätzungen verursachen. Bei der Entsorgung die örtlichen Bestimmungen für Sondermüll beachten. Beim Ersetzen der Bereitschafts-oder Systembatterie nur Batterien des Typs verwenden, der in der Ersatzteilliste aufgeführt ist. Der Einsatz falscher Batterien kann zu Entzündung oder Explosion führen.

(continued)

(continuation of safety notice 2)

סוללות המתנה מסוימות מכילות כמות קטנה של ניקל וקדמיום. אין לפרק סוללת המתנה, לטעון אותה מחדש, להשליך אותה לאש או למים או לקצר אותה. יש לסלק את הסוללה כנדרש על ידי התקנות והחוקים המקומיים. יש להשתמש רק בסוללה המופיעה ברשימת החלקים המתאימה. שימוש בסוללה לא מתאימה עלול לגרום להצתה או התפוצצות של הסוללה.

Alcune batterie di riserva contengono una piccola quantità di nichel e cadmio. Non smontarle, ricaricarle, gettarle nel fuoco o nell'acqua né cortocircuitarle. Smaltirle secondo la normativa in vigore (DPR 915/82, successive disposizioni e disposizioni locali). Quando si sostituisce la batteria dell'RTC (real time clock) o la batteria di supporto, utilizzare soltanto i tipi inseriti nell'appropriato Catalogo parti. L'impiego di una batteria non adatta potrebbe determinare l'incendio o l'esplosione della batteria stessa.

Algunas baterías de reserva contienen una pequeña cantidad de níquel y cadmio. No las desmonte, ni recargue, ni las eche al fuego o al agua ni las cortocircuite. Deséchelas tal como dispone la normativa local. Utilice sólo baterías que se encuentren en la lista de piezas. La utilización de una batería no apropiada puede provocar la ignición o explosión de la misma.

Safety notice 3



The battery pack contains small amounts of nickel. Do not disassemble it, throw it into fire or water, or short-circuit it. Dispose of the battery pack as required by local ordinances or regulations. Use only the battery in the appropriate parts listing when replacing the battery pack. Use of an incorrect battery can result in ignition or explosion of the battery.

La batterie contient du nickel. Ne la démontez pas, ne l'exposez ni au feu ni à l'eau. Ne la mettez pas en court-circuit. Pour la mettre au rebut, conformez-vous à la réglementation en vigueur. Lorsque vous remplacez la batterie, veillez à n'utiliser que les modèles cités dans la liste de pièces détachées adéquate. En effet, une batterie inappropriée risque de prendre feu ou d'exploser.

Akkus enthalten geringe Mengen von Nickel. Sie dürfen nicht zerlegt, wiederaufgeladen, kurzgeschlossen, oder Feuer oder Wasser ausgesetzt werden. Bei der Entsorgung die örtlichen Bestimmungen für Sondermüll beachten. Beim Ersetzen der Batterie nur Batterien des Typs verwenden, der in der Ersatzteilliste aufgeführt ist. Der Einsatz falscher Batterien kann zu Entzündung oder Explosion führen.

מארז הסוללה מכיל כמות קטנה של ניקל
וקדמיום. אין לפרק את מארז הסוללה, להשליך
אותו לאש או למים או לקצר אותו. יש לסלק את
מארז הסוללה הסוללה כנדרש על ידי התקנות
והחוקים המקומיים. יש להשתמש רק בסוללה
המופיעה ברשימת החלקים המתאימה בזמן החלפת
מארז הסוללה. שימוש בסוללה לא מתאימה עלול
לגרום להצתה או התפוצצות של הסוללה.

(continued)

(continuation of safety notice 3)

La batteria contiene piccole quantità di nichel. Non smontarla, gettarla nel fuoco o nell'acqua né cortocircuitarla. Smaltirla secondo la normativa in vigore (DPR 915/82, successive disposizioni e disposizioni locali). Quando si sostituisce la batteria, utilizzare soltanto i tipi inseriti nell'appropriato Catalogo parti. L'impiego di una batteria non adatta potrebbe determinare l'incendio o l'esplosione della batteria stessa.

Las baterías contienen pequeñas cantidades de níquel. No las desmonte, ni recargue, ni las eche al fuego o al agua ni las cortocircuite. Deséchelas tal como dispone la normativa local. Utilice sólo baterías que se encuentren en la lista de piezas al sustituir la batería. La utilización de una batería no apropiada puede provocar la ignición o explosión de la misma.

Safety notice 4



The lithium battery can cause a fire, an explosion, or a severe burn. Do not recharge it, remove its polarized connector, disassemble it, heat it above 100°C (212°F), incinerate it, or expose its cell contents to water. Dispose of the battery as required by local ordinances or regulations. Use only the battery in the appropriate parts listing. Use of an incorrect battery can result in ignition or explosion of the battery.

La pile de sauvegarde contient du lithium. Elle présente des risques d'incendie, d'explosion ou de brûlures graves. Ne la rechargez pas, ne retirez pas son connecteur polarisé et ne la démontez pas. Ne l'exposez pas à une température supérieure à 100°C, ne la faites pas brûler et n'en exposez pas le contenu à l'eau. Mettez la pile au rebut conformément à la réglementation en vigueur. Une pile inappropriée risque de prendre feu ou d'exploser.

Die Systematterie ist eine Lithiumatterie. Sie kann sich entzünden, explodieren oder schwere Verbrennungen hervorrufen. Batterien dieses Typs dürfen nicht aufgeladen, zerlegt, über 100 C erhitzt oder verbrannt werden. Auch darf ihr Inhalt nicht mit Wasser in Verbindung gebracht oder der zur richtigen Polung angebrachte Verbindungsstecker entfernt werden. Bei der Entsorgung die örtlichen Bestimmungen für Sondermüll beachten. Beim Ersetzen der Batterie nur Batterien des Typs verwenden, der in der Ersatzteilliste aufgeführt ist. Der Einsatz falscher Batterien kann zu Entzündung oder Explosion führen.

(continued)

(continuation of safety notice 4)

סוללת הליתיום עלולה לגרום לשריפה, להתפוצצות או לכוויות קשות. אין לטעון אותה מחדש, לסלק את המחבר המקוטב שלה, לפרק אותה או לחמם אותה לטמפרטורה העולה על 100 מעלות צלזיוס. אין לשרוף את הסוללה ואין לחשוף את תוכן התא למים. יש לסלק את הסוללה בנדרש בתקנות ובחוקים המקומיים. יש להשתמש רק בסוללה המופיעה ברשימת החלקים המתאימים. שימוש בסוללה אחרת עלול לגרום לסכנת שריפה או התפוצצות.

La batteria di supporto e una batteria al litio e puo incendiarsi, esplodere o procurare gravi ustioni. Evitare di ricaricarla, smontarne il connettore polarizzato, smontarla, riscaldarla ad una temperatura superiore ai 100 gradi centigradi, incendiarla o gettarla in acqua. Smaltirla secondo la normativa in vigore (DPR 915/82, successive disposizioni e disposizioni locali). L'impiego di una batteria non adatta potrebbe determinare l'incendio o l'esplosione della batteria stessa.

La batería de repuesto es una batería de litio y puede provocar incendios, explosiones o quemaduras graves. No la recargue, ni quite el conector polarizado, ni la desmonte, ni caliente por encima de los 100°C (212°F), ni la incinere ni exponga el contenido de sus celdas al agua. Deséchela tal como dispone la normativa local.

Safety notice 5

If the LCD breaks and the fluid from inside the LCD gets into your eyes or on your hands, immediately wash the affected areas with water for at least 15 minutes. Seek medical care if any symptoms from the fluid are present after washing.

Si le panneau d'affichage à cristaux liquides se brise et que vous recevez dans les yeux ou sur les mains une partie du fluide, rincez-les abondamment pendant au moins quinze minutes. Consultez un médecin si des symptômes persistent après le lavage.

Die Leuchtstoffröhre im LCD-Bildschirm enthält Quecksilber. Bei der Entsorgung die örtlichen Bestimmungen für Sondermüll beachten. Der LCD-Bildschirm besteht aus Glas und kann zerbrechen, wenn er unsachgemäß behandelt wird oder der Computer auf den Boden fällt. Wenn der Bildschirm beschädigt ist und die darin befindliche Flüssigkeit in Kontakt mit Haut und Augen gerät, sollten die betroffenen Stellen mindestens 15 Minuten mit Wasser abgespült und bei Beschwerden anschließend ein Arzt aufgesucht werden.

אם מסך הגביש הנוזלי (LCD) נשבר והנוזל מתוך המסך בא במגע עם עיניכם או ידיכם, שטפו את האזורים הנגועים מיד במים במשך 15 דקות לפחות. פנו לקבלת עזרה רפואית אם תסמינים הנובעים מהמגע עם הנוזל נמשכים לאחר השטיפה.

Nel caso che caso l'LCD si dovesse rompere ed il liquido in esso contenuto entrasse in contatto con gli occhi o le mani, lavare immediatamente le parti interessate con acqua corrente per almeno 15 minuti; poi consultare un medico se i sintomi dovessero permanere.

Si la LCD se rompe y el fluido de su interior entra en contacto con sus ojos o sus manos, lave inmediatamente las áreas afectadas con agua durante 15 minutos como mínimo. Obtenga atención medica si se presenta algún síntoma del fluido despues de lavarse.

Safety notice 6

To avoid shock, do not remove the plastic cover that protects the lower part of the inverter card.

Afin d'éviter tout risque de choc électrique, ne retirez pas le cache en plastique protégeant la partie inférieure de la carte d'alimentation.

Aus Sicherheitsgründen die Kunststoffabdeckung, die den unteren Teil der Spannungswandlerplatine umgibt, nicht entfernen.

כדי למנוע התחשמלות, אין להסיר את מכסה הפלסטיק המגן על חלקו התחתון של הכרטיס ההפוך.

Per evitare scosse elettriche, non rimuovere la copertura in plastica che avvolge la parte inferiore della scheda invertitore.

Para evitar descargas, no quite la cubierta de plástico que rodea la parte baja de la tarjeta invertida.

Safety notice 7



Though the main batteries have low voltage, a shorted or grounded battery can produce enough current to burn personnel or combustible materials.

Bien que le voltage des batteries principales soit peu élevé, le court-circuit ou la mise à la masse d'une batterie peut produire suffisamment de courant pour brûler des matériaux combustibles ou causer des brûlures corporelles graves.

Obwohl Hauptbatterien eine niedrige Spannung haben, können sie doch bei Kurzschluß oder Erdung genug Strom abgeben, um brennbare Materialien zu entzünden oder Verletzungen bei Personen hervorzurufen.

אף שהסוללות הראשיות הן בעלות מתח נמוך, סוללה מקוצרת או מוארקת עלולה להפיק זרם מספיק לגרימת כוויות או להצתת חומרים דליקים.

Sebbene le batterie di alimentazione siano a basso voltaggio, una batteria in corto circuito o a massa può fornire corrente sufficiente da bruciare materiali combustibili o provocare ustioni ai tecnici di manutenzione.

Aunque las baterías principales tienen un voltaje bajo, una batería cortocircuitada o con contacto a tierra puede producir la corriente suficiente como para quemar material combustible o provocar quemaduras en el personal.

Safety notice 8

**DANGER**

Before removing any FRU, power off the computer, unplug all power cords from electrical outlets, remove the battery pack, and then disconnect any interconnecting cables.

Avant de retirer une unité remplaçable en clientèle, mettez le système hors tension, débranchez tous les cordons d'alimentation des socles de prise de courant, retirez la batterie et déconnectez tous les cordons d'interface.

Die Stromzufuhr muß abgeschaltet, alle Stromkabel aus der Steckdose gezogen, der Akku entfernt und alle Verbindungskabel abgenommen sein, bevor eine FRU entfernt wird.

לפני סילוק FRU כלשהו, יש לכבות את המחשב, לנתק את כל כבלי החשמל משקעי החשמל, להוציא את מארז הסוללה, ואז לנתק כבלי חיבור אחרים אם יש כאלה.

Prima di rimuovere qualsiasi FRU, spegnere il sistema, scollegare dalle prese elettriche tutti i cavi di alimentazione, rimuovere la batteria e poi scollegare i cavi di interconnessione.

Antes de quitar una FRU, apague el sistema, desenchufe todos los cables de las tomas de corriente eléctrica, quite la batería y, a continuación, desconecte cualquier cable de conexión entre dispositivos.

Safety information

The following section presents safety information with which you need to be familiar before you service an IBM mobile computer.

General safety

Follow these rules to ensure general safety:

- Observe good housekeeping in the area of the machines during and after maintenance.
- When lifting any heavy object:
 1. Make sure that you can stand safely without slipping.
 2. Distribute the weight of the object equally between your feet.
 3. Use a slow lifting force. Never move suddenly or twist when you attempt to lift.
 4. Lift by standing or by pushing up with your leg muscles; this action removes the strain from the muscles in your back. *Do not attempt to lift any object that weighs more than 16 kg (35 lb) or that you think is too heavy for you.*
- Do not perform any action that causes hazards to the customer, or that makes the equipment unsafe.
- Before you start the machine, make sure that other service representatives and the customer's personnel are not in a hazardous position.
- Place removed covers and other parts in a safe place, away from all personnel, while you are servicing the machine.
- Keep your toolbox away from walk areas so that other people will not trip over it.
- Do not wear loose clothing that can be trapped in the moving parts of a machine. Make sure that your sleeves are fastened or rolled up above your elbows. If your hair is long, fasten it.
- Insert the ends of your necktie or scarf inside clothing or fasten it with a nonconductive clip, about 8 centimeters (3 inches) from the end.
- Do not wear jewelry, chains, metal-frame eyeglasses, or metal fasteners for your clothing.

Attention: Metal objects are good electrical conductors.
- Wear safety glasses when you are hammering, drilling, soldering, cutting wire, attaching springs, using solvents, or working in any other conditions that might be hazardous to your eyes.

- After service, reinstall all safety shields, guards, labels, and ground wires. Replace any safety device that is worn or defective.
- Reinstall all covers correctly before returning the machine to the customer.
- Fan louvers on the machine help to prevent overheating of internal components. Do not obstruct fan louvers or cover them with labels or stickers.

WARNING

Handling the cord on this product or cords associated with accessories sold with this product will expose you to lead, a chemical known to the State of California to cause cancer, and birth defects or other reproductive harm. ***Wash hands after handling.***

Electrical safety

Observe the following rules when working on electrical equipment.

Important

Use only approved tools and test equipment. Some hand tools have handles covered with a soft material that does not insulate you when working with live electrical currents.

Many customers have, near their equipment, rubber floor mats that contain small conductive fibers to decrease electrostatic discharges. Do not use this type of mat to protect yourself from electrical shock.

- Find the room emergency power-off (EPO) switch, disconnecting switch, or electrical outlet. If an electrical accident occurs, you can then operate the switch or unplug the power cord quickly.
- Do not work alone under hazardous conditions or near equipment that has hazardous voltages.
- Disconnect all power before:
 - Performing a mechanical inspection
 - Working near power supplies
 - Removing or installing main units
- Before you start to work on the machine, unplug the power cord. If you cannot unplug it, ask the customer to power-off the wall box that supplies power to the machine, and to lock the wall box in the off position.
- If you need to work on a machine that has *exposed* electrical circuits, observe the following precautions:

- Ensure that another person, familiar with the power-off controls, is near you.

Attention: Another person must be there to switch off the power, if necessary.

- Use only one hand when working with powered-on electrical equipment; keep the other hand in your pocket or behind your back.

Attention: An electrical shock can occur only when there is a complete circuit. By observing the above rule, you may prevent a current from passing through your body.

- When using testers, set the controls correctly and use the approved probe leads and accessories for that tester.
- Stand on suitable rubber mats (obtained locally, if necessary) to insulate you from grounds such as metal floor strips and machine frames.

Observe the special safety precautions when you work with very high voltages; Instructions for these precautions are in the safety sections of maintenance information. Use extreme care when measuring high voltages.

- Regularly inspect and maintain your electrical hand tools for safe operational condition.
- Do not use worn or broken tools and testers.
- *Never assume* that power has been disconnected from a circuit. First, *check* that it has been powered off.
- Always look carefully for possible hazards in your work area. Examples of these hazards are moist floors, nongrounded power extension cables, power surges, and missing safety grounds.
- Do not touch live electrical circuits with the reflective surface of a plastic dental mirror. The surface is conductive; such touching can cause personal injury and machine damage.
- Do not service the following parts *with the power on* when they are removed from their normal operating places in a machine:
 - Power supply units
 - Pumps
 - Blowers and fans
 - Motor generators

and similar units. (This practice ensures correct grounding of the units.)

- If an electrical accident occurs:
 - Use caution; do not become a victim yourself.
 - Switch off power.
 - Send another person to get medical aid.

Safety inspection guide

The purpose of this inspection guide is to assist you in identifying potentially unsafe conditions. As each machine was designed and built, required safety items were installed to protect users and service personnel from injury. This guide addresses only those items. You should use good judgment to identify potential safety hazards due to attachment of non-IBM features or options not covered by this inspection guide.

If any unsafe conditions are present, you must determine how serious the apparent hazard could be and whether you can continue without first correcting the problem.

Consider these conditions and the safety hazards they present:

- Electrical hazards, especially primary power (primary voltage on the frame can cause serious or fatal electrical shock)
- Explosive hazards, such as a damaged CRT face or a bulging capacitor
- Mechanical hazards, such as loose or missing hardware

To determine whether there are any potentially unsafe conditions, use the following checklist at the beginning of every service task. Begin the checks with the power off, and the power cord disconnected.

Checklist:

1. Check exterior covers for damage (loose, broken, or sharp edges).
2. Power off the computer. Disconnect the power cord.
3. Check the power cord for:
 - a. A third-wire ground connector in good condition. Use a meter to measure third-wire ground continuity for 0.1 ohm or less between the external ground pin and the frame ground.
 - b. The power cord should be the type specified in the parts list.
 - c. Insulation must not be frayed or worn.
4. Remove the cover.
5. Check for any obvious non-IBM alterations. Use good judgment as to the safety of any non-IBM alterations.
6. Check inside the unit for any obvious unsafe conditions, such as metal filings, contamination, water or other liquids, or signs of fire or smoke damage.
7. Check for worn, frayed, or pinched cables.

8. Check that the power-supply cover fasteners (screws or rivets) have not been removed or tampered with.

Handling devices that are sensitive to electrostatic discharge

Any computer part containing transistors or integrated circuits (ICs) should be considered sensitive to electrostatic discharge (ESD.) ESD damage can occur when there is a difference in charge between objects. Protect against ESD damage by equalizing the charge so that the machine, the part, the work mat, and the person handling the part are all at the same charge.

Notes

1. Use product-specific ESD procedures when they exceed the requirements noted here.
2. Make sure that the ESD protective devices you use have been certified (ISO 9000) as fully effective.

When handling ESD-sensitive parts:

- Keep the parts in protective packages until they are inserted into the product.
- Avoid contact with other people.
- Wear a grounded wrist strap against your skin to eliminate static on your body.
- Prevent the part from touching your clothing. Most clothing is insulative and retains a charge even when you are wearing a wrist strap.
- Use the black side of a grounded work mat to provide a static-free work surface. The mat is especially useful when handling ESD-sensitive devices.
- Select a grounding system, such as those listed below, to provide protection that meets the specific service requirement.

Note

The use of a grounding system to guard against ESD damage is desirable but not necessary.

- Attach the ESD ground clip to any frame ground, ground braid, or green-wire ground.
- When working on a double-insulated or battery-operated system, use an ESD common ground or reference point. You can use coax or connector-outside shells on these systems.

- Use the round ground prong of the ac plug on ac-operated computers.

Grounding requirements

Electrical grounding of the computer is required for operator safety and correct system function. Proper grounding of the electrical outlet can be verified by a certified electrician.

Laser compliance statement

Some IBM Personal Computer models are equipped from the factory with an optical storage device such as a CD-ROM drive or a DVD-ROM drive. Such devices are also sold separately as options. If one of these drives is installed, it is certified in the U.S. to conform to the requirements of the Department of Health and Human Services 21 Code of Federal Regulations (DHHS 21 CFR) Subchapter J for Class 1 laser products. Elsewhere, the drive is certified to conform to the requirements of the International Electrotechnical Commission (IEC) 825 and CENELEC EN 60 825 for Class 1 laser products.

If a CD-ROM drive, a DVD-ROM drive, or another laser device is installed, note the following:

 CAUTION:

Use of controls or adjustments or performance of procedures other than those specified herein might result in hazardous radiation exposure.

O uso de controles, ajustes ou desempenho de procedimentos diferentes daqueles aqui especificados pode resultar em perigosa exposição à radiação.

凡未在这里指明的任何控制用法、调整、行为，都会导致严重后果。

Pour éviter tout risque d'exposition au rayon laser, respectez les consignes de réglage et d'utilisation des commandes, ainsi que les procédures décrites.

Werden Steuer- und Einstellelemente anders als hier festgesetzt verwendet, kann gefährliche Laserstrahlung auftreten.

Az itt előírt eljárásoktól, beállításoktól és vezérlésektől eltérni a lézersugárzás veszélye miatt kockázatos !

L'utilizzo di controlli, regolazioni o l'esecuzione di procedure diverse da quelle specificate possono provocare l'esposizione a.

Использование элементов настройки и выполнение процедур иных, чем указано здесь, может привести к опасному радиационному облучению.

Použitie kontrôl, úprav alebo iných vykonaní od iných výrobcov, ako je v tomto špecifikované, mohlo by mať za následok nebezpečenstvo vystavenia sa vyžiarovaniu.

El uso de controles o ajustes o la ejecución de procedimientos distintos de los aquí especificados puede provocar la exposición a radiaciones peligrosas.

Opening the CD-ROM drive, the DVD-ROM drive, or any other optical storage device could result in exposure to hazardous laser radiation. There are no serviceable parts inside those drives. **Do not open.**

A CD-ROM drive, a DVD-ROM drive, or any other storage device installed may contain an embedded Class 3A or Class 3B laser diode. Note the following:

⚠ DANGER

Emits visible and invisible laser radiation when open. Do not stare into the beam, do not view directly with optical instruments, and avoid direct exposure to the beam.

Radiação por raio laser ao abrir. Não olhe fixo no feixe de luz, não olhe diretamente por meio de instrumentos óticos e evite exposição direta com o feixe de luz.

开启时会有激光发射时，请勿盯视激光光束，请勿直接查看视觉仪器，并且避免直接接触在激光光束之中。

Rayonnement laser si carter ouvert. Évitez de fixer le faisceau, de le regarder directement avec des instruments optiques, ou de vous exposer au rayon.

Laserstrahlung bei geöffnetem Gerät. Nicht direkt oder über optische Instrumente in den Laserstrahl sehen und den Strahlungsbereich meiden.

Kinyitáskor lézersugár ! Ne nézzen bele se szabad szemmel, se optikai eszközökkel. Kerülje a sugárnyalábbal való érintkezést !.

Aperto l'unità vengono emesse radiazioni laser. Non fissare il fascio, non guardarlo direttamente con strumenti ottici e evitare l'esposizione diretta al fascio.

Открывая, берегитесь лазерного излучения. Не смотрите на луч, не разглядывайте его с помощью оптических инструментов, а также избегайте прямого воздействия лазерного луча.

Ked' je laserová jednotka otvorená. Vyhnite sa priamemu pohľadu a nehládte priamo s optickými nástrojmi do lúča a vyhnite sa priamemu vystaveniu lúčov.

Radiación láser al abrir. No mire fijamente ni examine con instrumental óptico el haz de luz. Evite la exposición directa al haz.

General descriptions

The descriptions in this chapter apply to any ThinkPad model that has the PC-Doctor® DOS diagnostics program. Some descriptions might not apply to your particular computer.

Read this first

Before you go to the checkout guide, be sure to read this section.

Important notes

- **Only certified trained personnel should service the computer.**
- **Before replacing any FRU, read the entire page on removing and replacing FRUs.**
- **When you replace FRUs, use new nylon-coated screws.**
- **Be extremely careful during such write operations as copying, saving, or formatting.** Drives in the computer that you are servicing sequence might have been altered. If you select an incorrect drive, data or programs might be overwritten.
- **Replace an FRU only with another FRU of the correct model.** When you replace a FRU, make sure that the model of the machine and the FRU part number are correct by referring to the FRU parts list.
- **A FRU should not be replaced because of a single, unreproducible failure.** Single failures can occur for a variety of reasons that have nothing to do with a hardware defect, such as cosmic radiation, electrostatic discharge, or software errors. Consider replacing a FRU only when a problem recurs. If you suspect that a FRU is defective, clear the error log and run the test again. If the error does not recur, do not replace the FRU.
- **Be careful not to replace a nondefective FRU.**

What to do first

When you do return a FRU, you must include the following information in the parts exchange form or parts return form that you attach to it:

- ___ 1. Name and phone number of servicer

- ___ 2. Date of service
- ___ 3. Date on which the machine failed
- ___ 4. Date of purchase
- ___ 5. Failure symptoms, error codes appearing on the display, and beep symptoms
- ___ 6. Procedure index and page number in which the failing FRU was detected
- ___ 7. Failing FRU name and part number
- ___ 8. Machine type, model number, and serial number
- ___ 9. Customer's name and address

Note for warranty:

During the warranty period, the customer may be responsible for repair costs if the computer damage was caused by misuse, accident, modification, unsuitable physical or operating environment, or improper maintenance by the customer. Following is a list of some common items that are not covered under warranty and some symptoms that might indicate that the system was subjected to stress beyond normal use.

Before checking problems with the computer, determine whether the damage is covered under the warranty by referring to the following list:

The following are not covered under warranty:

- LCD panel cracked from the application of excessive force or from being dropped
- Scratched (cosmetic) parts
- Distortion, deformation, or discoloration of the cosmetic parts
- Plastic parts, latches, pins, or connectors that have been cracked or broken by excessive force
- Damage caused by liquid spilled into the system
- Damage caused by the improper insertion of a PC Card or the installation of an incompatible card
- Diskette drive damage caused by pressure on the diskette drive cover, foreign material in the drive, or the insertion of a diskette with multiple labels
- Damaged or bent diskette eject button
- Fuses blown by attachment of a nonsupported device
- Forgotten computer password (making the computer unusable)
- Sticky keys caused by spilling a liquid onto the keyboard

The following symptoms might indicate damage caused by nonwarranted activities:

- Missing parts might be a symptom of unauthorized service or modification.
- If the spindle of a hard disk drive becomes noisy, it may have been subjected to excessive force, or dropped.

Related service information

This section provides information about the following:

- “Service web site”
- “Restoring the pre-installed system”
- “Passwords” on page 28
- “Power management” on page 33

Service web site

When the latest maintenance diskette and the system program service diskette become available, a notice will be posted on <http://www.ibm.com/pc/partner/infotips>

Restoring the pre-installed system

When the hard disk drive is replaced because of a failure, no Product Recovery program is on the new hard disk. In this case, you must use the recovery CD for the computer. Order the recovery CD and the hard disk drive at the same time so that you can recover the new hard disk drive with the pre-installed software when they arrive. For information on which CD to order, see “Recovery CDs” on page 172

Recovery to Factory Contents by using Product Recovery CDs

To create the service partition and install the factory contents from the recovery CD, do the following:

Note

The recovery process might take up to 2 hours.
--

1. Insert the recovery CD into the CD or DVD drive, then restart the computer.
2. Following message is displayed: **“Your computer originally included a Product Recovery program ... Reinstall the Product Recovery program? (Y/N) []”**.
3. Press Y key. The service partition is created and loaded with the Product Recovery program files.
4. At next window, press Enter to continue.
 - The service partition is created. The system automatically reboots during this process.
 - The recovery process copies some files to the service partition, and PKUNZIPs others.
 - Follow the prompts. You may be prompted to change CDs.
 - When the process is complete, the system reboots.

5. If you get a message asking which operating system to install, select the proper operating system and press Enter.
6. A message is displayed: “**Full Recovery:**”. Press Enter to select.
7. On each of the next three windows, press the Y key.
8. Follow the prompts to complete the recovery.

Passwords

As many as three passwords may be needed for any ThinkPad computer: the power-on password (POP), the hard-disk password (HDP), and the supervisor password (SVP).

If any of these passwords has been set, a prompt for it appears on the screen whenever the computer is turned on. The computer does not start until the password is entered.

Exception: If only an SVP is installed, the password prompt does not appear when the operating system is booted.

Power-on password:

A power-on password (POP) protects the system from being powered on by an unauthorized person. The password must be entered before an operating system can be booted.

Hard-disk password:

There are two hard-disk passwords (HDPs):

- User HDP—for the user
- Master HDP—for the system administrator, who can use it to get access to the hard disk even if the user has changed the user HDP

Note: There are two modes for the HDP: **User only** and **Master + User**. The **Master + User** mode requires two HDPs; the system administrator enters both in the same operation. The system administrator then provides the user HDP to the system user.

Attention: If the user HDP has been forgotten, check whether a master HDP has been set. If it has, it can be used for access to the hard disk drive. If no master HDP is available, IBM does not provide any services to reset either the user or the master HDP, or to recover data from the hard disk drive. The hard disk drive can be replaced for a scheduled fee.

Supervisor password:

A supervisor password (SVP) protects the system information stored in the IBM BIOS Setup Utility. The SVP must be entered in order to get access to the IBM BIOS Setup Utility and make changes to system configuration settings.

Attention: If the SVP has been forgotten and cannot be made available to the servicer, there is no service procedure to reset the password. The system board must be replaced for a scheduled fee.

How to remove the power-on password

To remove a POP that you have forgotten, do the following:

(A) If no SVP has been set:

1. Turn off the computer.
2. Remove the battery pack.

For how to remove the battery pack, see “1010 Battery pack” on page 71.

3. Remove the backup battery.

For how to remove the backup battery, see “1050 Backup battery” on page 76.

4. Turn on the computer and wait until the POST ends.

After the POST ends, the password prompt does not appear. The POP has been removed.

5. Reinstall the backup battery and the battery pack.

(B) If an SVP has been set and is known by the servicer:

For X30 series:

1. Turn on the computer, and press F1 when three messages (F1, F11, and F12) appear on the screen.
2. Enter the SVP. The IBM BIOS Setup Utility menu appears.
3. Select **Password**, using the cursor keys to move down the menu.
4. Select **Power-On Password**.
5. At the Enter Current Password field, enter the SVP.
6. When the Enter New Password field opens, leave it blank and press Enter twice.
7. In the Changes have been saved window, press Enter.
8. Press F10; then, in the Setup confirmation window, select **Yes**.

For MT2672-2xx, 8xx, 9xx, Axx, Bxx, Cxx, Dxx, Exx, Fxx, Gxx, Hxx, Jxx, Kxx, Lxx, Nxx, Pxx, Qxx, Rxx,

MT2673-Cxx, Nxx, Pxx, MT2884-2xx, Bxx, Cxx, Gxx, Jxx, Mxx, Nxx, MT2885-Pxx, Rxx, MT2890-8xx, 9xx, Axx, Cxx, MT2891-8xx, Axx, Cxx in X31 series:

1. Turn on the computer; then, while the “To interrupt normal startup, press the blue Access IBM button” message is displayed at the lower-left of the screen, press the Access IBM button.
2. Enter the SVP. Double-click **Start setup utility**.
3. Select **Security**, using the cursor keys to move down the menu.
4. Select **Password**.
5. Select **Power-On Password**.
6. At the **Enter Current Password** field, enter the SVP.
7. When the **Enter New Password** field opens, leave it blank and press Enter twice.
8. In the Changes have been saved window, press Enter.
9. Press F10; then, in the Setup confirmation window, select **Yes** .

For MT2672-3xx, 5xx, MT2673-5xx, MT2884-6xx, 7xx, MT2885-6xx, 7xx in X31 series:

1. Turn on the computer; then, while the “To interrupt normal startup, press the blue Access IBM button” message is displayed at the lower-left of the screen, press the Access IBM button. IBM Rescue and Recovery screen opens.

For models supporting the Passphrase function, press F1 while POP icon is appearing on the screen; then enter the POP. For the other models, enter the POP.

Note: To check whether the ThinkPad computer supports the Passphrase function, enter IBM BIOS Setup Utility and go to **Security --> Password**. If **Using Passphrase** item is displayed in the menu, this function is available on the ThinkPad computer.

2. Click **Access BIOS**. The system Restart Required window is displayed.
3. Click **Yes**. The computer restarts, and the IBM BIOS Setup Utility screen opens.
4. Select **Security**, using the cursor directional keys to move down the menu.
5. Select **Password**.
6. Select **Power-On Password**.
7. Type the current SVP in the **Enter Current Password** field. then leave the **Enter New Password** field blank, and press Enter twice.
8. In the Changes have been saved window, press Enter.

9. Press F10; then, in the Setup confirmation window, select **Yes**.

How to remove the hard-disk password

Attention: If **User only** mode is selected and the user HDP has been forgotten and cannot be made available to the servicer, IBM does not provide any services to reset the user HDPs or to recover data from the hard disk drive. The hard disk drive can be replaced for a scheduled fee.

To remove a user HDP that has been forgotten, when the SVP and the master HDP are known, do the following:

For X30 series:

1. Turn on the computer, and press F1 when three messages (F1, F11, and F12) appear on the screen.
2. Enter the SVP. The IBM BIOS Setup Utility menu appears.
3. Select **Password**, using the cursor keys to move down the menu.
4. Select **Hard-disk x password**, where x is the letter of the hard disk drive. A pop-up window opens.
5. Select **Master HDP**.
6. Enter the master HDP; then leave the New Password field blank and press Enter twice.
7. Press F10.
8. Select **Yes** in the Setup Configuration window.

Both user HDP and master HDP will have been removed.

For MT2672-2xx, 8xx, 9xx, Axx, Bxx, Cxx, Dxx, Exx, Fxx, Gxx, Hxx, Jxx, Kxx, Lxx, Nxx, Pxx, Qxx, Rxx, MT2673-Cxx, Nxx, Pxx, MT2884-2xx, Bxx, Cxx, Gxx, Jxx, Mxx, Nxx, MT2885-Pxx, Rxx, MT2890-8xx, 9xx, Axx, Cxx, MT2891-8xx, Axx, Cxx in X31 series:

1. Turn on the computer; then, while the "To interrupt normal startup, press the blue Access IBM button" message is displayed at the lower-left of the screen, press the Access IBM button.
2. For models supporting the Passphrase function, press F1 while HDP icon is appearing on the screen; then enter the master HDP. For the other models, enter the master HDP.

Note: To check whether the ThinkPad computer supports the Passphrase function, enter IBM BIOS Setup Utility and go to **Security --> Password**. If **Using Passphrase** item is displayed in the menu, this function is available on the ThinkPad computer.

3. Double-click **Start setup utility**. Enter SVP.
4. Select **Security**, using the cursor keys to move down the menu.
5. Select **Password**.
6. Select **Hard-disk x password**, where x is the letter of the hard disk drive. A pop-up window opens.
7. Select **Master HDP**.
8. Enter the master HDP; then leave the New Password field blank and press Enter twice.
9. Press F10.
10. Select **Yes** in the Setup Configuration window.
Both user HDP and master HDP will have been removed.

For MT2672-3xx, 5xx, MT2673-5xx, MT2884-6xx, 7xx, MT2885-6xx, 7xx in X31 series:

1. Turn on the computer; then, while the "To interrupt normal startup, press the blue Access IBM button" message is displayed at the lower-left of the screen, press the Access IBM button. IBM Rescue and Recovery screen opens.

For models supporting the Passphrase function, press F1 while HDP icon is appearing on the screen; then enter the master HDP. For the other models, enter the master HDP.

Note: To check whether the ThinkPad computer supports the Passphrase function, enter IBM BIOS Setup Utility and go to **Security --> Password**. If **Using Passphrase** item is displayed in the menu, this function is available on the ThinkPad computer.

2. Click **Access BIOS**. The system Restart Required window is displayed.
3. Click **Yes**. The computer restarts, and the IBM BIOS Setup Utility screen opens.
4. Select **Security**, using the cursor directional keys to move down the menu.
5. Select **Password**.
6. Select **Hard-disk x password**, where x is the letter of the hard disk drive. A pop-up window opens.
7. Select **Master HDP**.
8. Type the current master HDP in the **Enter Current Password** field. then leave the **Enter New Password** field blank, and press Enter twice.
9. Press F10.
10. Select **Yes** in the Setup Configuration window.

Both user HDP and master HDP will have been removed.

Power management

To reduce power consumption, the computer has three power management modes: screen blank, standby, and hibernation.

Screen blank mode

Screen blank mode has three variants, as follows:

1. If you press Fn+F3, or if the time set on the “LCD off timer” in IBM BIOS Setup Utility expires,
 - The LCD backlight turns off.
 - The hard disk drive motor stops.
 - The speaker is muted.
2. If you are using the ACPI operating system and you press Fn+F3,
 - The LCD backlight turns off.
 - The hard disk drive motor stops.
3. If the time set on the “Turn off monitor” timer in the operating system expires,
 - The LCD backlight turns off.

To end screen blank mode and resume normal operation, press any key.

Standby mode

When the computer enters standby mode, the following events occur in addition to what occurs in screen blank mode:

- The LCD is powered off.
- The hard disk drive is powered off.
- The CPU stops.

To enter standby mode, press Fn+F4.

Note: If you are using the ACPI operating system, you can change the action of Fn+F4.s

In certain circumstances, the computer goes into standby mode automatically:

- If a “suspend time” has been set on the timer, and the user does not do any operation with the keyboard, the TrackPoint, the hard disk, the parallel connector, or the diskette drive within that time.
- If the battery indicator blinks orange, indicating that the battery power is low. (Alternatively, if **Hibernate when battery becomes low** has been selected in the “Power Management Properties” window, the computer goes into hibernation mode.)

Note for the APM operating system:

Even if you do not set the low-battery alarm, the charge indicator notifies you when the battery is low, and then the computer enters the power-saving mode automatically. This default low-battery behavior is independent of the operating system; so if you have set the low-battery alarm, the computer may not do what you specified. It chooses either your setting or the default setting, whichever is appropriate.

If you are using the ACPI operating system, only the low-battery alarm is available.

To cause the computer to return from standby mode and resume operation, do one of the following:

- Press the Fn key.
- Open the LCD cover.
- Turn on the power switch.

Also, in either of the following events, the computer automatically returns from standby mode and resumes operation:

- The ring indicator (RI) is signaled by a serial device or a PC Card device.
- The time set on the resume timer elapses.

Note: The computer does not accept any input immediately after it enters standby mode. Wait a few seconds before taking any action to reenter operation mode.

Hibernation mode

In hibernation mode, the following occurs:

- The system status, RAM, VRAM, and setup data are stored on the hard disk.
- The system is powered off.

Note: If the computer enters the hibernation mode while it is docked to the docking station, do not undock it before resuming normal operation. If you do undock it and then try to resume normal operation, you will get an error message, and you will have to restart the system.

To cause the computer to enter hibernation mode, do any of the following:

- Press the Fn+F12 keys.
- If you are using the APM operating system and have set the mode to **Power switch mode [Hibernation]**, turn off the power switch.

- If you are using the ACPI operating system and have defined one of the following actions as the event that causes the system to go into hibernation mode, perform that action.
 - Closing the lid.
 - Pressing the power button.
 - Pressing Fn+F4 keys.

Also, the computer goes into hibernation mode automatically in either of the following conditions:

- If a “hibernation time” has been set on the timer, and if the user does not do any operation with the keyboard, the TrackPoint, the hard disk drive, the parallel connector, or the diskette drive within that time.
- If the timer conditions are satisfied in suspend mode.
- If you are using the APM operating system and have set the mode to **Hibernate when battery becomes low**, and the battery charge becomes critically low.

When the power is turned on, the computer returns from hibernation mode and resumes operation. The hibernation file in the boot record on the hard disk drive is read, and system status is restored from the hard disk drive.

Checkout guide

Use the following procedures as a guide in identifying and correcting problems with the ThinkPad computer.

Note: The diagnostic tests are intended to test only IBM products. The use of non-IBM products, prototype cards, or modified options can lead to false indications of errors and invalid system responses.

1. Identify the failing symptoms in as much detail as possible.
2. Verify the symptoms. Try to re-create the failure by running the diagnostic test or by repeating the operation.

Testing the computer

The ThinkPad computer has a test program called PC-Doctor® DOS (hereafter called *PC-Doctor*). You can detect errors by running the diagnostics test included in PC-Doctor. This section is an overview of the procedure. For details that depend on model-unique functions, refer to “Product overview” on page 45.

For some possible configurations of the computer, PC-Doctor might not run correctly. To avoid this problem, you need to initialize the computer setup by use of the IBM BIOS Setup Utility before you run PC-Doctor. On the IBM BIOS Setup Utility screen, press F9, Enter, F10, and then Enter.

Note: When you initialize the computer configuration, some devices are disabled, such as the serial port. If you test one of these devices, you will need to enable it by using PS2.EXE.

PC-Doctor cannot be used to test a device that is in the docking station, even if the computer supports the docking station. To test a USB device, connect it to the USB connector of the computer. To test the Ultrabay device, install it in the Ultrabay Plus slot of the computer.

Creating the PC-Doctor diagnostics diskette

In X31 series, the PC-Doctor disk can be created by using the Access IBM Predesktop Area.

To create the PC-Doctor disk from the Access IBM Predesktop Area, do as follows:

1. Enter the IBM Predesktop application by pressing the Access IBM button during POST.
2. When the Access IBM application finishes loading, double-click the "Create Diagnostic Diskettes" icon.
3. It will take about 15 seconds to authenticate the digital signature, and then the ThinkPad computer will reboot into PC-DOS.
4. A batch file will automatically start up to prompt the user through creating the boot diskettes. The user will be informed how many diskettes will be needed.
 - a. The user will be prompted to insert each diskette in sequence.
 - b. Typically, the user only needs to press the Enter key for the proper floppy drive to format and create the diskette.
 - c. Each diskette will be erased and formatted with the PC-Doctor DOS boot image.
5. Once all the diskettes have been created, the ThinkPad computer will reboot. The user is asked to remove all diskettes from the drive, or to insert the first diskette created if it is desired to run the diagnostics.

To run the test, do as follows:

Note: In the following procedure, you can select an item not only with the arrow keys, but also with the TrackPoint. Instead of pressing Enter, click the left button.

1. Insert the PC-Doctor disk into the diskette drive; then power on the computer.

If the computer cannot be powered on, go to "Power system checkout" on page 40, and check the power sources.

If an error code appears, go to "Symptom-to-FRU index" on page 57.

On the first screen, select the model and press Enter. Follow the instructions on the screen.

2. The main panel of PC-Doctor appears.

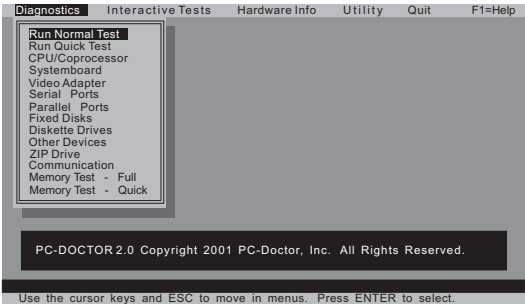
3. Select **Diagnostics** with the arrow keys, and press Enter.

A pull-down menu appears. (Its exact form depends on the model.)

Note: PC-Doctor menu does not mean the formal support device list. Some unsupported device names may appear in the PC-Doctor menu.

The options on the test menu are as follows:

Diagnostics	Interactive Tests
• Run Normal Test • Run Quick Test • CPU/Coprocessor • Systemboard • Video Adapter • Serial Ports • Parallel Ports • Fixed Disks • Diskette Drives • Other Devices • ZIP Drive • LS-120/240 Drive (*) • Communication • Wireless LAN • Memory Test – Full • Memory Test – Quick	• Keyboard • Video • Internal Speaker • Mouse • Diskette • System Load • CD-ROM/DVD Test • Intel Wireless Radio
Notes: • In the Keyboard test in Interactive Tests, the Fn key should be held down for at least 2 seconds; otherwise, it cannot be sensed. • Video Adapter test supports only the LCD display on the ThinkPad computer. Before running PC-Doctor DOS, detach the external Monitor. • To test ZIP Drive or LS-120/240 Drive, each media is needed to be inserted before start testing. • To test Digital Signature Chip, the chip must be enabled. • When Legacy Floppy Drives is enabled in the IBM BIOS Setup Utility, Diskette Drives test is activated even if no legacy diskette drive is attached to the ThinkPad computer. • LS-120/240 Drive test is only for X30.	



4. Run the applicable function test.
5. Follow the instructions on the screen. If there is a problem, PC-Doctor shows messages describing it.
6. To exit the test, select **Quit — Exit Diag.**

To cancel the test, press Esc.

Note: After executing PC-Doctor, check the system time/date and reset them if needed.

Detecting system information with PC-Doctor

PC-Doctor can detect the following system information:

Hardware Info

- System Configuration
- Memory Contents
- Physical Disk Drives
- Logical Disk Drives
- VGA Information
- IDE Drive Info
- PCI Information
- PNPISA Info
- SMBIOS Info
- VESA LCD Info

Utility

- Run External Tests
- Surface Scan Hard Disk
- Benchmark System
- DOS Shell
- Tech Support Form
- Battery Rundown
- View Test Log
- Print Log
- Save Log
- Full Erase Hard Drive
- Quick Erase Hard Drive

Power system checkout

To verify a symptom, do the following:

1. Power off the computer.
2. Remove the battery pack.
3. Connect the ac adapter.
4. Check that power is supplied when you power on the computer.
5. Power off the computer.
6. Disconnect the ac adapter and install the charged battery pack.
7. Check that the battery pack supplies power when you power on the computer.

If you suspect a power problem, see the appropriate one of the following power supply checkouts:

- “Checking the ac adapter”
- “Checking operational charging” on page 41
- “Checking the battery pack” on page 41
- “Checking the backup battery” on page 42

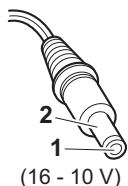
Checking the ac adapter

You are here because the computer fails only when the ac adapter is used:

- If the power problem occurs only when the port replicator is used, replace the port replicator.
- If the power-on indicator does not turn on, check the power cord of the ac adapter for correct continuity and installation.
- If the computer does not charge during operation, go to “Checking operational charging.”

To check the ac adapter, do the following:

1. Unplug the ac adapter cable from the computer.
2. Measure the output voltage at the plug of the ac adapter cable. See the following figure:



Pin	Voltage (V dc)
1	+15.5 to +17.0
2	Ground

3. If the voltage is not correct, replace the ac adapter.
4. If the voltage is acceptable, do the following:
 - Replace the system board.
 - If the problem persists, go to “Product overview” on page 45.

Note: Noise from the ac adapter does not always indicate a defect.

Checking operational charging

To check whether the battery charges properly during operation, use a discharged battery pack or a battery pack that has less than 50% of the total power remaining when installed in the computer.

Perform operational charging. If the battery status indicator or icon does not turn on, remove the battery pack and let it return to room temperature. Reinstall the battery pack. If the charge indicator or icon still does not turn on, replace the battery pack.

If the charge indicator still does not turn on, replace the system board. Then reinstall the battery pack. If it is still not charged, go to the next section.

Checking the battery pack

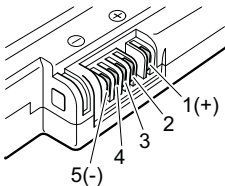
Battery charging does not start until the Power Meter shows that less than 95% of the total power remains; under this condition the battery pack can charge to 100% of its capacity. This protects the battery pack from being overcharged or from having a shortened life.

To check the status of your battery, move your cursor to the Power Meter icon in the icon tray of the Windows taskbar and wait for a moment (but do not click), and the percentage of battery power remaining is displayed. To get detailed information about the battery, double-click the Power Meter icon.

Note: If the battery pack becomes hot, it may not be able to charge. Remove it from the computer and leave it at room temperature for a while. After it cools down, reinstall and recharge it.

To check the battery pack, do the following:

1. Power off the computer.
2. Remove the battery pack and measure the voltage between battery terminals 1 (+) and 5 (–). See the following figure:



Terminal	Voltage (V dc)
1	+ 0 to + 12.6
5	Ground (–)

3. If the voltage is less than +11.0 V dc, the battery pack has been discharged.

Note: Recharging will take at least 3 hours, even if the indicator does not turn on.

If the voltage is still less than +11.0 V dc after recharging, replace the battery.

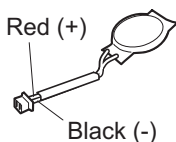
4. If the voltage is more than +11.0 V dc, measure the resistance between battery terminals 4 and 5. The resistance must be 4 to 30 K Ω .

If the resistance is not correct, replace the battery pack. If the resistance is correct, replace the system board.

Checking the backup battery

Do the following:

1. Power off the computer, and unplug the ac adapter from it.
2. Turn the computer upside down.
3. Remove the battery pack (see “1010 Battery pack” on page 71).
4. Remove the backup battery (see “Checking the battery pack” on page 41).
5. Measure the voltage of the backup battery. See the following figure.



Wire	Voltage (V dc)
Red	+2.5 to +3.2
Black	Ground

- If the voltage is correct, replace the system board.
- If the voltage is not correct, replace the backup battery.
- If the backup battery discharges quickly after replacement, replace the system board.

ThinkPad X30, X31

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Product overview

This section presents the following product-unique information:

- “Specifications”
- “Status indicators” on page 48
- “For X31 series” on page 50
- “FRU tests” on page 52
- “Fn key combinations” on page 53

Specifications

Feature	Description
Processor	X30 series • Mobile Intel® Pentium® III processor 1.06 GHz - M, L2 512 KB cache • Mobile Intel® Pentium® III processor 1.2 GHz - M, L2 512 KB cache X31 series • Intel® Pentium® M processor 1.3 GHz, L2 1-MB cache • Intel® Pentium® M processor 1.4 GHz, L2 1-MB cache • Intel® Pentium® M processor 1.5 GHz, L2 1-MB cache • Intel® Pentium® M processor 1.6 GHz, L2 1-MB cache • Intel® Pentium® M processor 1.7 GHz, L2 1-MB cache
Memory (standard)	X30 series • 128 MB SDRAM SO DIMM (PC133) card × 1 • 256 MB SDRAM SO DIMM (PC133) card × 1 X31 series • 256 MB DDR SDRAM SO DIMM (PC2100) card × 1 (some models) • 512 MB DDR SDRAM SO DIMM (PC2100) card × 1 (some models) • 256 MB DDR SDRAM SO DIMM (PC2700) card × 1 (some models) • 512 MB DDR SDRAM SO DIMM (PC2700) card × 1 (some models)
Memory (optional)	X30 series • 64 MB SDRAM SO DIMM (PC133) card • 128 MB SDRAM SO DIMM (PC133) card • 256 MB SDRAM SO DIMM (PC133) card • 512 MB SDRAM SO DIMM (PC133) card (maximum of 1024 MB)

(continued)

Feature	Description
Memory (optional)	X31 series • 128 MB DDR SDRAM SO DIMM (PC2100) card • 256 MB DDR SDRAM SO DIMM (PC2100) card • 512 MB DDR SDRAM SO DIMM (PC2100) card • 1 GB DDR SDRAM SO DIMM (PC2100) card • 128 MB DDR SDRAM SO DIMM (PC2700) card • 256 MB DDR SDRAM SO DIMM (PC2700) card • 512 MB DDR SDRAM SO DIMM (PC2700) card • 1 GB DDR SDRAM SO DIMM (PC2700) card (maximum of 2048 MB)
Bus architecture	• HUB link • PCI bus • LPC bus
Graphic memory	X30 series MAX 32 MB DVMT (Dynamic Video Memory Technology) X31 series 16 MB Local Video Memory
CMOS RAM	• 242 bytes
Hard disk drive	X30 series • 20.0 GB, 2.5-inch, IDE interface • 40.0 GB, 2.5-inch, IDE interface X31 series • 20.0 GB, 2.5-inch, IDE interface • 30.0 GB, 2.5-inch, IDE interface • 40.0 GB, 2.5-inch, IDE interface
Display	• 12.1-inch, 16M colors, XGA (1024 × 768 resolution) TFT color LCD
I/O port (system)	• External monitor connector • RJ11 • RJ45 • Parallel connector • Stereo headphone jack • Monaural microphone jack • Stereo line-in jack • Universal serial bus (USB) connector × 2 • Infrared port • Docking connector • DC-in • IEEE 1394 connector

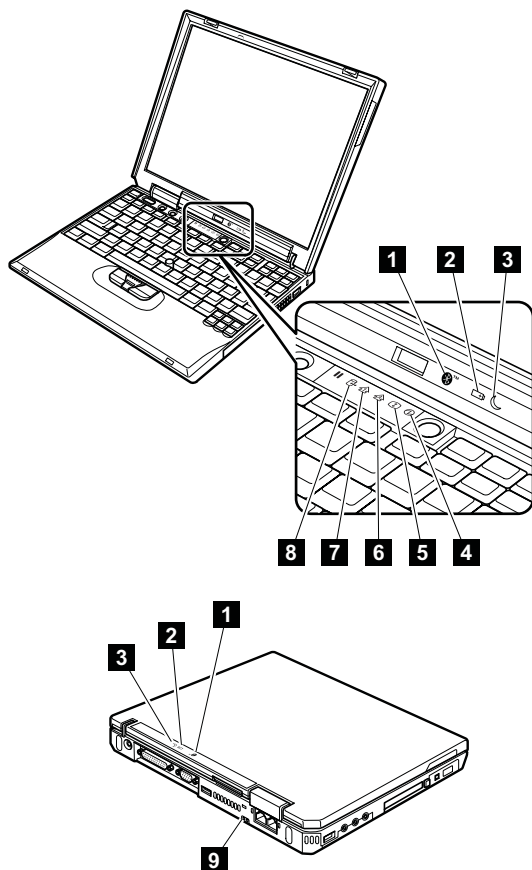
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Feature	Description
I/O port (UltraBase)	- External monitor connector - RJ11 - RJ45 - Parallel connector - Serial connector - Keyboard or mouse connector - Universal serial bus (USB) connector - DC-in
Internal modem	56.6 Kbps
Audio	- Internal monaural speaker - Software control volume
Infrared transfer	IrDA 1.1
Mini PCI adapter	X30 series - IBM High Rate Wireless LAN Mini-PCI Adapter with Modem II (some models) - Cisco Aironet Wireless 802.11b Mini PCI by IBM (some models) X31 series - Cisco Aironet Wireless 802.11b Mini PCI by IBM (some models) - Intel® PRO/Wireless LAN 2100 3B Mini PCI Adapter (some models) - IBM Dual-Band 11a/b Wi-Fi Wireless Mini PCI Adapter (some models) - IBM 11a/b/g Wireless LAN Mini PCI Adapter (some models) - IBM 11b/g Wireless LAN Mini PCI Adapter (some models)
PC Card	One Type-II
CompactFlash card	One Type-II
Ultrabay device	Ultrabay Plus (supported by UltraBase X3)
Diskette drive (external)	1.44 MB (3-mode), 3.5-inch diskette drive (some models)
Communication daughter card (CDC)	- V.90 modem daughter card (MDC) (some models) <i>Bluetooth</i> daughter card (BDC) (some models) - IBM Integrated <i>Bluetooth</i> with 56 Modem (BMDC) (some models)
AC adapter	56-watt type
Battery pack (main)	6-cell Li-Ion battery pack (4.4 AH)
Preinstalled operating system	- Windows 2000 - Windows XP Professional - Windows XP Home edition

Status indicators

The system status indicators show the status of the computer, as follows:

For X30 series



Indicator	Meaning
1 <i>Bluetooth</i> wireless status 	Green: The <i>Bluetooth</i> wireless is operational. This indicator is on when the <i>Bluetooth</i> wireless is on and not in suspend mode.

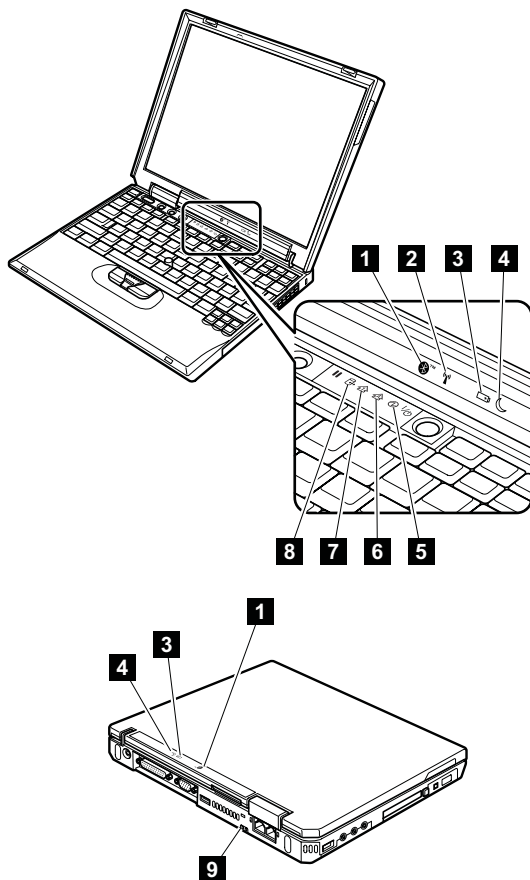
(continued)

Indicator	Meaning
2 Battery status 	Green: The battery is in use and has enough power. The ac adapter has charged the battery completely. Blinking green: The battery is being charged, but still has enough power to operate. (At regular intervals, the indicator light turns off briefly.) Orange: The battery is being charged, but the battery power is still low. Blinking orange: The battery needs to be charged. When the indicator starts blinking orange, the computer beeps three times.
3 Standby status 	Green: The computer is in standby mode. Blinking green: The computer is entering standby mode or hibernation mode, or is resuming normal operation.
4 Power on 	Green: The computer is on and ready to use. This indicator stays lit whenever the computer is on and is not in standby mode.
5 Scroll lock 	Green: Scroll Lock mode is enabled. The Arrow keys can be used as screen-scroll function keys. The cursor cannot be moved with the Arrow keys. Not all application programs support this function. To enable or disable Scroll Lock mode, press the ScrLk key.
6 Caps lock 	Green: Caps Lock mode is enabled. To enable or disable Caps Lock mode, press the Caps Lock key.
7 Num lock 	Green: The numeric keypad on the keyboard is enabled. To enable or disable the keypad, press and hold the Shift key, and press the NumLk (ScrLk) key.
8 Drive in use 	Green: Data is being read from or written to the hard disk drive, the diskette drive, or the drive in the Ultrabay device. When this indicator is on, do not put the computer into standby mode or turn off the computer. Note: Do not move the system while the Green drive in use light is on. Sudden physical shock could cause drive errors.

(continued)

Indicator	Meaning
9 Ethernet status 	Green: The computer connects to a LAN and a session with the network is available. Blinking yellow: Data is being transmitted.

For X31 series



Indicator	Meaning
1 Bluetooth wireless status 	Green: The <i>Bluetooth</i> wireless is operational. This indicator is on when the <i>Bluetooth</i> wireless is on and not in suspend mode.

(continued)

Indicator	Meaning
2 Wireless status 	Green: Wireless is operational and radio on state. This indicator is on when the data is transmitted.
3 Battery status 	Green: The battery is in use and has enough power. The ac adapter has charged the battery completely. Blinking green: The battery is being charged, but still has enough power to operate. (At regular intervals, the indicator light turns off briefly.) Orange: The battery is being charged, but the battery power is still low. Blinking orange: The battery needs to be charged. When the indicator starts blinking orange, the computer beeps three times.
4 Standby status 	Green: The computer is in standby mode. Blinking green: The computer is entering standby mode or hibernation mode, or is resuming normal operation.
5 Power on 	Green: The computer is on and ready to use. This indicator stays lit whenever the computer is on and is not in standby mode.
6 Caps lock 	Green: Caps Lock mode is enabled. To enable or disable Caps Lock mode, press the Caps Lock key.
7 Num lock 	Green: The numeric keypad on the keyboard is enabled. To enable or disable the keypad, press and hold the Shift key, and press the NumLk (ScrLk) key.
8 Drive in use 	Green: Data is being read from or written to the hard disk drive, the diskette drive, or the drive in the Ultrabay device. When this indicator is on, do not put the computer into standby mode or turn off the computer. Note: Do not move the system while the Green drive in use light is on. Sudden physical shock could cause drive errors.
9 Ethernet status 	Green: The computer connects to a LAN and a session with the network is available. Blinking yellow: Data is being transmitted.

FRU tests

The following table shows the test for each FRU.

FRU	Applicable test
System board	1. Diagnostics --> CPU/Coprocessor 2. Diagnostics --> Systemboard
Power	Diagnostics --> Other Devices --> IBM AC Adapter, IBM Battery 1 (IBM Battery 2)
LCD unit	1. Diagnostics --> Video Adapter 2. Interactive Tests --> Video
Modem, MDC or BMDC	1. Make sure the modem is set up correctly. 2. Replace the modem jack and the modem card in turn, and run the following test in Diagnostics --> Communication: a. Lucent Soft Modem Loopback b. Lucent Soft Modem Daltone
Audio	1. Interactive Tests --> Internal Speaker 2. Diagnostics --> Other Devices --> Analog Devices AC97 CODEC Test
Speaker	Interactive Tests --> Internal Speaker
PC Card slots	1. Diagnostics --> Systemboard --> PCMCIA 2. Insert a PC Card Wrap Plug into every PC Card slot, and run Diagnostics --> Systemboard --> PCMCIA External Loop
Keyboard	1. Diagnostics --> Systemboard --> Keyboard 2. Interactive Tests --> Keyboard
TrackPoint or pointing device	If the TrackPoint does not work, check the configuration in the ThinkPad Configuration program. If the TrackPoint is disabled, select Enable to enable it. After you use the TrackPoint, the pointer may drift on the screen for a short time. This drift can occur when a slight, steady pressure is applied to the TrackPoint pointer. This symptom is not a hardware problem. If the pointer stops after a short time, no service action is necessary. If enabling the TrackPoint does not correct the problem, continue with the following: • Interactive Tests --> Mouse
Hard disk drive	Diagnostics --> Fixed Disks
Diskette drive	1. Diagnostics --> Diskette Drives 2. Interactive Tests --> Diskette
CD-ROM or DVD drive	1. Diagnostics --> Other Devices --> CD-ROM/DVD 2. Interactive Tests --> CD-ROM/DVD Test

(continued)

FRU	Applicable test
Memory	1. If two DIMMs are installed, remove one of them and run Diagnostics --> Memory Test - Quick. 2. If the problem does not recur, return the DIMM to its place, remove the other one, and run the test again. 3. If the test does not detect the error, run Diagnostics --> Memory Test - Full.
Fan	1. Turn on the computer and check the air turbulence at the louver near the power switch. 2. Run Diagnostics --> Other Devices --> IBM Fan.

Fn key combinations

The following table shows the function of each combination of Fn with a function key.

Key combination	Description
Fn+F1	Reserved.
Fn+F2	Reserved.
Fn+F3	Turn off the LCD display, leaving the screen blank. To turn the LCD display on again, press any key or the TrackPoint stick.
Fn+F4	Turn standby mode on. To return to normal operation, press the Fn key independently, without pressing a function key. Notes: 1. This mode is called suspend mode in Windows NT. 2. In Windows XP and Windows 2000, this combination of buttons functions as a sleep button. The user can change the setting so that pressing it puts the computer into hibernation mode or even shuts the computer down.

(continued)

Key combination	Description
Fn+F5	Note: This function is supported only in X31 series. X30 series does not have this function. Control the power source of the built-in <i>Bluetooth</i> wireless device. This combination of the keys functions as a toggle switch of the power state. Note: In Windows 2000 or Windows XP or Windows 98, this combination of keys enables or disables the built-in wireless networking features (the IEEE 802.11 standard) and the <i>Bluetooth</i> wireless features. To use this function, the following drivers must be installed. • IBM ThinkPad Power Management driver • OnScreen Display utility • Wireless device drivers
Fn+F6	Reserved.
Fn+F7	Switch a display output location • External monitor (CRT display) • Computer display and external monitor (LCD + CRT display) • Computer display (LCD) Note: For any operating system other than Windows 2000 or Windows XP, no additional procedure is needed; just press Fn+F7. Notes: 1. This function does not work when different desktop images are displayed on the computer display and the external monitor (the Extend desktop function). 2. This function does not work while a DVD movie or a video clip is playing. 3. For Windows 2000 or Windows XP, a hotkey application might take over the switching function.
Fn+F8	Turn screen expansion on or off. (There is no symbol on the key.) Note: This function is not supported in Windows XP and Windows 2000.

(continued)

Key combination	Description
Fn+F9	Note: This function is supported only in X31 series. X30 series does not have this function. Opens the IBM ThinkPad EasyEject Utility screen. Buttons for the following choices are displayed: • Eject ThinkPad PC from Dock: This button is displayed only if the ThinkPad computer have been attached to a ThinkPad Dock II or a ThinkPad Dock. You can detach the computer from the ThinkPad Dock II or the ThinkPad Dock. • Eject ThinkPad PC from X3 UltraBase: This button is displayed only if the ThinkPad computer have been attached to X3 UltraBase. You can detach the computer from the X3 UltraBase. • Eject ThinkPad PC from Mini Dock: This button is displayed only if the ThinkPad computer have been attached to ThinkPad Mini Dock and either have been connected a diskette drive to the external-diskette-drive connector of the ThinkPad Mini Dock, or attached one or more USB devices to the ThinkPad Mini Dock. If you click the button, you can stop all the USB devices and remove them safely. Note: If a diskette drive is connected to the external-diskette-drive connector of the ThinkPad Mini Dock, you cannot connect a USB diskette drive. • Run EasyEject Actions: User can select, stop, and remove external devices connected to the ThinkPad computer. • Configure EasyEject Actions: User can open the IBM ThinkPad EasyEject Utility main window. • Fn+F9 Settings: User can configure the settings for the Fn+F9 function. Notes: 1. This function is supported only in Windows XP and Windows 2000. 2. This Utility is used to stop and remove all ejectable devices connected to the ThinkPad computer, the ThinkPad Mini Dock, the ThinkPad Port Replicator II, and the ThinkPad Port Replicator. You cannot use it to detach the computer from ThinkPad Mini Dock, the ThinkPad Port Replicator II, and the ThinkPad Port Replicator.
Fn+F10	Reserved.

(continued)

Key combination	Description
Fn+F11	Reserved.
Fn+F12	Turn hibernation mode on. To return to normal operation, press the power button for less than four seconds. Note: To use Fn+F12 for hibernation in Windows XP and Windows 2000, the IBM PM device driver must have been installed on the computer.
Fn+PgUp	Turn the ThinkLight on or off. Note: This function is supported only on the ThinkPad computer that have the ThinkLight. The on or off status of the ThinkLight is shown on the screen for a few seconds when the user press Fn+PgUp.
Fn+Home	The LCD becomes brighter.
Fn+End	The LCD becomes less bright.
Fn+Spacebar	Enable the FullScreen Magnifier function.

Symptom-to-FRU index

The symptom-to-FRU index in this section lists symptoms and errors and their possible causes. The most likely cause is listed first, in boldface type.

Note: Do the FRU replacement or other actions in the sequence shown in the column headed “FRU or action, in sequence.” If replacing a FRU does not solve the problem, put the original part back in the computer. Do not replace a nondefective FRU.

This index can also help you determine, during regular servicing, what FRUs are likely to need to be replaced next.

A numeric error is displayed for each error detected in POST or system operation. In the displays, **n** can be any number.

If no numeric code is displayed, check the narrative descriptions of symptoms. If the symptom is not described there, go to “Intermittent problems” on page 65.

Note

For an IBM device not supported by diagnostic codes in the ThinkPad notebook computers, see the manual for that device.

Numeric error codes

Symptom or error	FRU or action, in sequence
0175 Bad CRC1, stop POST task—The EEPROM checksum is not correct.	System board.
0176 System Security—The system has been tampered with.	Run IBM BIOS Setup Utility, and save the current setting by pressing F10. - System board.
0177 Bad SVP data, stop POST task—The checksum of the supervisor password in the EEPROM is not correct.	System board

Symptom or error	FRU or action, in sequence
0182 Bad CRC2. Enter BIOS Setup and load Setup defaults.—The checksum of the CRS2 setting in the EEPROM is not correct.	1. Run IBM BIOS Setup Utility. Press F9, and Enter to load the default setting. Then save the current setting by pressing F10. 2. System board.
0185 Bad startup sequence settings. Enter BIOS Setup and load Setup defaults.	1. Run IBM BIOS Setup Utility. Press F9, and Enter to load the default setting. Then save the current setting by pressing F10.
0187 EAIA data access error—The access to EEPROM is failed.	System board.
0188 Invalid RFID Serialization Information Area.	System board.
0189 Invalid RFID configuration information area—The EEPROM checksum is not correct.	System board.
0190 Critical low-battery error	1. Charge the battery pack. 2. Battery pack.
0191 System Security—Invalid Remote Change requested.	1. Run IBM BIOS Setup Utility, and then save current setting by pressing F10. 2. System board.
0192 System Security—IBM Embedded Security hardware tamper detected.	System board.
0199 System Security—IBM Security password retry count exceeded.	1. Run IBM BIOS Setup Utility, and then save the current setting by pressing F10. 2. System board.
01C8 Two or more modem devices are found. Remove all but one of them. Press <Esc> to continue.	1. Remove either a Mini-PCI Card or a modem daughter card. Otherwise, press Esc to ignore the warning message. 2. System board.
01C9 More than one Ethernet devices are found. Remove one of them. Press <Esc> to continue.	1. Remove the Ethernet device that you installed; or press Esc to ignore the warning message. 2. System board.

Symptom or error	FRU or action, in sequence
0200 Hard disk error—The hard disk is not working.	1. Reseat the hard disk drive. 2. Load Setup Defaults in IBM BIOS Setup Utility. 3. Hard disk drive. 4. System board.
021x Keyboard error.	Run interactive tests of the keyboard and the auxiliary input device.
0220 Monitor type error—Monitor type does not match the one specified in CMOS.	Load Setup Defaults in IBM BIOS Setup Utility.
0230 Shadow RAM error—Shadow RAM fails at offset nnnn.	System board.
0231 System RAM error—System RAM fails at offset nnnn.	1. DIMM. 2. System board.
0232 Extended RAM error—Extended RAM fails at offset nnnn.	1. DIMM. 2. System board.
0250 System battery error—System battery is dead.	Replace the backup battery and run IBM BIOS Setup Utility to reset the time and date.
0251 System CMOS checksum bad— Default configuration used.	Replace the backup battery and run IBM BIOS Setup Utility to reset the time and date.
0252 Password checksum bad—The password is cleared.	Reset the password by running IBM BIOS Setup Utility.
0260 System timer error.	1. Replace the backup battery and run IBM BIOS Setup Utility to reset the time and date. 2. System board.
0270 Real-time clock error.	1. Replace the backup battery and run IBM BIOS Setup Utility to reset the time and date. 2. System board.
0271 Date and time error—Neither the date nor the time is set in the computer.	Run IBM BIOS Setup Utility to reset the time and date.
0280 Previous boot incomplete—Default configuration used.	1. Load “Setup Default” in IBM BIOS Setup Utility. 2. DIMM. 3. System board.

Symptom or error	FRU or action, in sequence
02B2 Incorrect drive A type.	1. Diskette drive. 2. External FDD cable. 3. I/O card.
02F4 EISA CMOS not writable.	1. Load Setup Defaults in IBM BIOS Setup Utility. 2. Replace the backup battery. 3. System board.
02F5 DMA test failed.	1. DIMM. 2. System board.
02F6 Software NMI failed	1. DIMM. 2. System board.
02F7 Fail-safe timer NMI failed	1. DIMM. 2. System board.
1801 Attached docking station is not supported	Shut down the computer and remove it from the docking station.
1802 Unauthorized network card is plugged in—Turn off and remove the miniPCI network card.	1. Remove Mini PCI network card. 2. System board.
1803 Unauthorized daughter card is plugged in—Turn off and remove the daughter card.	1. Remove the daughter card that you installed. 2. System board.

Symptom or error	FRU or action, in sequence
1810 Hard disk partition layout error.	1. If the Access IBM Predesktop Area has been previously disabled, then go to the IBM BIOS Setup Utility by pressing F1 to open the IBM BIOS Setup Utility. Select Security --> IBM Predesktop Area --> Access IBM Predesktop Area. Set this item to Disabled. Save and exit. 2. If the Access IBM Predesktop Area has not been previously disabled, press Enter to load Access IBM Predesktop Area. Then run RECOVER TO FACTORY CONTENTS in Access IBM Predesktop Area. 3. If item 2 failed, press F3 in the Welcome screen in RECOVER TO FACTORY CONTENTS. Run FDISK, and then delete all partitions. Run RECOVER TO FACTORY CONTENTS in Access IBM Predesktop Area again. 4. If item 3 failed, select CD-ROM boot in Startup in Access IBM Predesktop Area. Boot from the Recovery CD and perform full recovery from it. 5. If item 4 failed, replace the hard disk drive.

Error messages

Symptom or error	FRU or action, in sequence
Device address conflict.	1. Load “Setup Defaults” in IBM BIOS Setup Utility. 2. Backup battery. 3. System board.
Allocation error for device.	1. Load “Setup Defaults” in IBM BIOS Setup Utility. 2. Backup battery. 3. System board.
Failing bits: nnnn.	1. DIMM. 2. System board.
Invalid system configuration data.	1. DIMM. 2. System board.
I/O device IRQ conflict.	1. Load “Setup Defaults” in IBM BIOS Setup Utility. 2. Backup battery. 3. System board.
Operating system not found.	1. Check that the operating system has no failure and is installed correctly. 2. Enter IBM BIOS Setup Utility and see whether the hard disk drive and the diskette drive are properly identified. 3. Reseat the hard disk drive. 4. Reinstall the operating system. 5. Diskette drive. 6. Hard disk drive. 7. System board.
Hibernation error.	1. Restore the system configuration to what it was before the computer entered hibernation mode. 2. If memory size has been changed, re-create the hibernation file.
Fan error.	Fan.
Thermal sensing error.	System board.
Authentication of system services failed. Press <Esc> to resume.	The IBM Predesktop Area in the HDD is corrupted. Restore it from a recovery CD.

Beep symptoms

Symptom or error	FRU or action, in sequence
One beep and a blank, unreadable, or flashing LCD.	1. Reseat the LCD connector. 2. LCD assembly. 3. External CRT. 4. System board.
One long and two short beeps, and a blank or unreadable LCD.	1. System board. 2. LCD assembly. 3. DIMM.
Two short beeps with error codes.	POST error. See “Numeric error codes” on page 57.
Two short beeps and a blank screen.	1. System board. 2. DIMM.
Three short beeps, pause, three more short beeps, and one short beep.	1. DIMM. 2. System board
One short beep, pause, three short beeps, pause, three more short beeps, and one short beep.	
Only the cursor appears.	Reinstall the operating system.
Four cycles of four short beeps and a blank screen.	System board (IBM security chip)
Five short beeps and a blank screen.	System board

No-beep symptoms

Symptom or error	FRU or action, in sequence
No beep, power-on indicator on, LCD blank, and no POST.	1. Make sure that every connector is connected tightly and correctly. 2. DIMM. 3. System board.
No beep, power-on indicator on, and LCD blank during POST.	1. Reseat DIMM. 2. System board.
The power-on password prompt appears.	A power-on password or a supervisor password is set. Type the password and press Enter .
The hard-disk password prompt appears.	A hard-disk password is set. Type the password and press Enter .
The DOS full screen looks smaller than it should.	Start the ThinkPad Configuration program and set the Screen expansion function.

LCD-related symptoms

Important

The TFT LCD for the notebook computer contains many thin-film transistors (TFTs). The presence of a small number of dots that are missing, discolored, or always lighted is characteristic of TFT LCD technology, but excessive pixel problems can cause viewing concerns. The LCD should be replaced if the number of missing, discolored, or lighted dots in any background is:

- **XGA:** 8 or more bright dots, 8 or more dark dots, or a total of 9 or more bright and dark dots.

Note: A bright dot means a pixel is always on (white or color.) A dark dot means a pixel is always off (black color.)

Symptom or error	FRU or action, in sequence
No beep, power-on indicator on, and a blank LCD during POST.	System board.
• LCD backlight not working. • LCD too dark. • LCD brightness cannot be adjusted. • LCD contrast cannot be adjusted.	1. Reseat the LCD connectors. 2. LCD assembly. 3. System board.
• LCD screen unreadable. • Characters missing pixels. • Screen abnormal. • Wrong color displayed.	1. See important note for “LCD-related symptoms.” 2. Reseat all LCD connectors. 3. LCD assembly. 4. System board.
Horizontal or vertical lines displayed on LCD.	LCD assembly.

Intermittent problems

Intermittent system hang problems can be due to a variety of causes that have nothing to do with a hardware defect, such as cosmic radiation, electrostatic discharge, or software errors. FRU replacement should be considered only when a problem recurs.

When analyzing an intermittent problem, do the following:

1. Run the diagnostic test for the system board in loop mode **at least 10 times**.
2. If no error is detected, do **not** replace any FRUs.
3. If any error is detected, replace the FRU shown by the FRU code. Rerun the test to verify that no more errors exist.

Undetermined problems

If the diagnostic tests did not identify the adapter or device that has failed, if wrong devices are installed, or if the system simply is not operating, follow these procedures to isolate the failing FRU (do not isolate FRUs that have no defects).

Verify that all attached devices are supported by the computer.

Verify that the power supply being used at the time of the failure is operating correctly. (See “Power system checkout” on page 40.)

1. Turn off the computer.
2. Visually check each FRU for damage. Replace any damaged FRU.
3. Remove or disconnect all of the following devices:
 - a. Non-IBM devices
 - b. Devices attached to the port replicator
 - c. Printer, mouse, and other external devices
 - d. Battery pack
 - e. Hard disk drive
 - f. External diskette drive
 - g. DIMM
 - h. CD-ROM and diskette drive in the Ultrabay
 - i. PC Cards
4. Turn on the computer.
5. Determine whether the problem has been solved.
6. If the problem does not recur, reconnect the removed devices one at a time until you find the failing FRU.
7. If the problem remains, replace the following FRUs one at a time (do not replace a nondefective FRU):
 - a. System board
 - b. LCD assembly

FRU replacement notices

This section contains notices related to removing and replacing parts. Read this section carefully before replacing any FRU.

Screw notices

Loose screws can cause a reliability problem. In the IBM ThinkPad computer, this problem is addressed with special nylon-coated screws that have the following characteristics:

- They maintain tight connections.
- They do not easily come loose, even with shock or vibration.
- They are harder to tighten.
- Each one should be used only once.

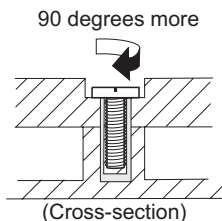
Do the following when you service this machine:

- Keep the screw kit (for the P/N, see “Miscellaneous parts” on page 177) in your tool bag.
- Always use new screws.
- Use a torque screwdriver if you have one.

Tighten screws as follows:

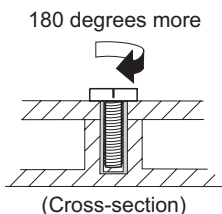
- **Plastic to plastic**

Turn an additional **90 degrees** after the screw head touches the surface of the plastic part:



- **Logic card to plastic**

Turn an additional **180 degrees** after the screw head touches the surface of the logic card:



- **Torque driver**

If you have a torque driver, refer to the “Torque” column for each step.

- Make sure that you use the correct screw. If you have a torque screwdriver, tighten all screws firmly to the torque shown in the table. **Never use a screw that you removed. Use a new one. Make sure that all of the screws are tightened firmly.**

Retaining serial numbers

This section includes the following descriptions:

- “Restoring the serial number of the system unit”
- “Retaining the UUID” on page 68
- “Reading or writing the ECA information” on page 68

Restoring the serial number of the system unit

When the computer was manufactured, the EEPROM on the system board was loaded with the serial numbers of the system and all major components. These numbers need to remain the same throughout the life of the computer.

If you replace the system board, you must restore the serial number of the system unit to its original value.

Before replacing the system board, save the original serial number by doing the following:

1. Install the ThinkPad Hardware Maintenance Diskette Version 1.70, and restart the computer.
2. From the main menu, select **1. Set System Identification**.
3. Select **2. Read S/N data from EEPROM**.

The serial number of each device in your computer is displayed; the serial number of the system unit is listed as follows:

20: Serial number

Write down that number.

Note: The serial number of the system unit is also written on the label attached to the bottom of the computer.

After you have replaced the system board, restore the serial number by doing the following:

1. Install the ThinkPad Hardware Maintenance Diskette Version 1.70 and restart the computer.
2. From the main menu, select **1. Set System Identification**.
3. Select **1. Add S/N data from EEPROM**.

Follow the instructions on the screen.

Retaining the UUID

The Universally Unique Identifier (UUID) is a 128-bit number uniquely assigned to your computer at production and stored in the EEPROM of your system board. The algorithm that generates the number is designed to provide unique IDs until the year A.D. 3400. No two computers in the world have the same number.

When you replace the system board, you must set the UUID on the new system board as follows:

1. Install the ThinkPad Hardware Maintenance Diskette Version 1.70, and restart the computer.
2. From the main menu, select **4. Assign UUID**.

A new UUID is created and written. If a valid UUID already exists, it is not overwritten.

Reading or writing the ECA information

Information on Engineering Change Announcements (ECA) are stored in the EEPROM of the system board. The electronic storage of this information simplifies the procedure to check if the ECA has been previously applied to a machine. The machine does not need to be disassembled to check for the ECA application.

To check what ECAs have been previously applied to the machine, use the ECA Information Read/Write function on the ThinkPad Hardware Maintenance Diskette Version 1.70.

1. Insert the ThinkPad Hardware Maintenance Diskette Version 1.70, and restart the computer.
2. From the main menu, select **6. Set ECA Information**.
3. To read ECA information, select **2. Read ECA/rework number from EEPROM** and follow the instruction.
4. To read box build date, select **5. Read box build date from EEPROM**, and follow the instruction on the screen.

After an ECA has been applied to the machine, the EEPROM must be updated to reflect the ECA's application. Use the ThinkPad Hardware Maintenance Diskette Version 1.70 to update the EEPROM.

Note: Only the ECA number is stored in the EEPROM. The machine type of the ECA is assumed be the same as the machine type of the machine that had the ECA applied to it.

1. Insert the ThinkPad Hardware Maintenance Diskette Version 1.70, and restart the computer.
2. From the main menu, select **6. Set ECA Information**.

3. To write ECA information, select **1. Write ECA/rework number from EEPROM**, and follow the instruction.
4. To write box build date, select **4. Write box build date from EEPROM**, and follow the instruction on the screen.

If the system board is being replaced, try to read the ECA information from the old system board and transfer the information to the new system. If the system board is inoperable, this will not be possible.

Removing and replacing a FRU

This section presents directions and drawings for use in removing and replacing a FRU. Be sure to observe the following general rules:

1. Do not try to service any computer unless you have been trained and certified. An untrained person runs the risk of damaging parts.
2. Before replacing any FRU, review “FRU replacement notices” on page 66.
3. Begin by removing any FRUs that have to be removed before the failing FRU. Any such FRUs are listed at the top of the page. Remove them in the order in which they are listed.
4. Follow the correct sequence in the steps for removing the FRU, as given in the drawings by the numbers in square callouts.
5. When turning a screw to replace a FRU, turn it in the direction as given by the arrow in the drawing.
6. When removing the FRU, move it in the direction as given by the arrow in the drawing.
7. To put the new FRU in place, reverse the removal procedure and follow any notes that pertain to replacement. For information about connecting and arranging internal cables, see “Locations” on page 138.
8. When replacing a FRU, use the correct screw as shown in the procedures.

DANGER

Before removing any FRU, turn off the computer, unplug all power cords from electrical outlets, remove the battery pack, and then disconnect any interconnecting cables.

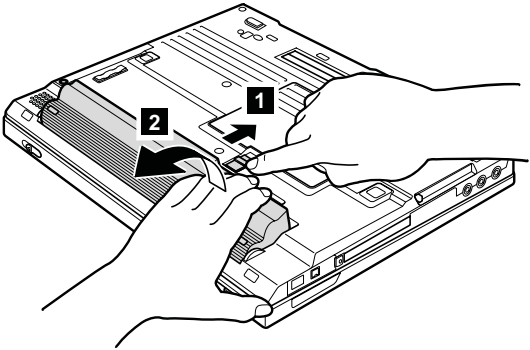
Attention: After replacing a FRU, do not turn on the computer until you have made sure that all screws, springs, and other small parts are in place and none are loose inside the computer. Verify this by shaking the computer gently and listening for rattling sounds. Metallic parts or metal flakes can cause electrical short circuits.

Attention: The system board is sensitive to, and can be damaged by, electrostatic discharge. Before touching it, establish personal grounding by touching a ground point with one hand or by using an electrostatic discharge (ESD) strap (P/N 6405959).

1010 Battery pack

 **DANGER**

Use only the battery specified in the parts list for your computer. The use of an incorrect battery can result in ignition or explosion of the battery.



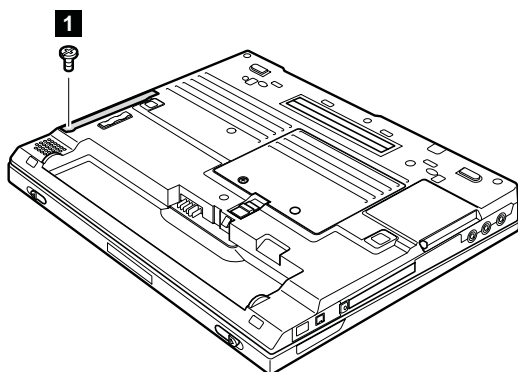
1020 Hard disk drive

Attention

- **Do not drop or apply any shock to the hard disk drive.** The hard disk drive is sensitive to physical shock. Incorrect handling can cause damage and permanent loss of data.
- Before removing the drive, have the user make a backup copy of all the information on the drive if possible.
- Never remove the drive while the system is operating or is in suspend mode.

For access, remove following FRU:

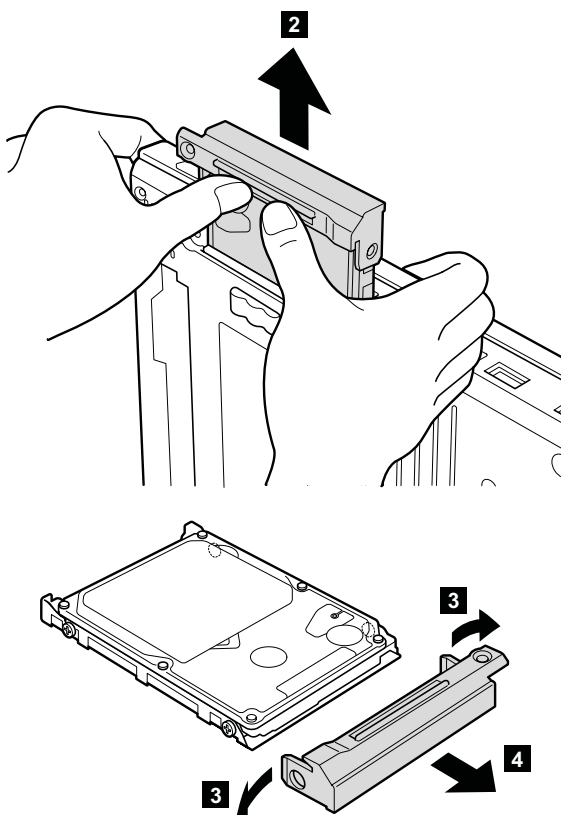
- “1010 Battery pack” on page 71



Note: The hard disk is attached to the cover.

Step	Screw (quantity)	Torque
1	M3 × 4 mm, nylon-coated (1)	0.4 Nm (4 kgfcm)

(continued)



When installing: Make sure that the hard disk is connected firmly.

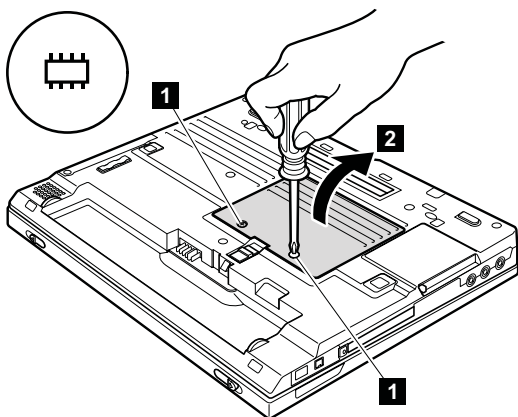
1030 DIMM cover

For access, remove following FRU:

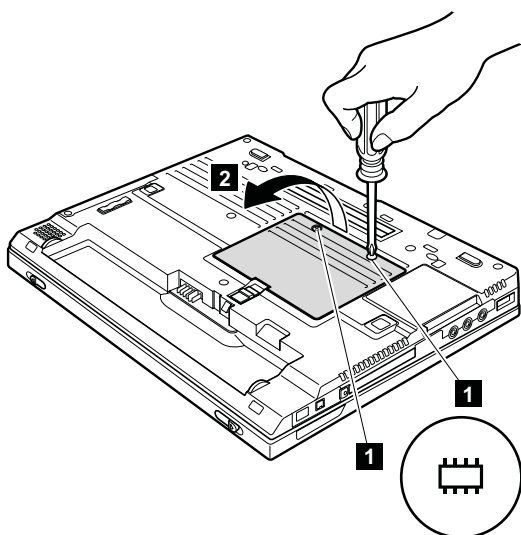
- “1010 Battery pack” on page 71

Note: Loosen the screws **1**, but do not remove them.

For X30 series



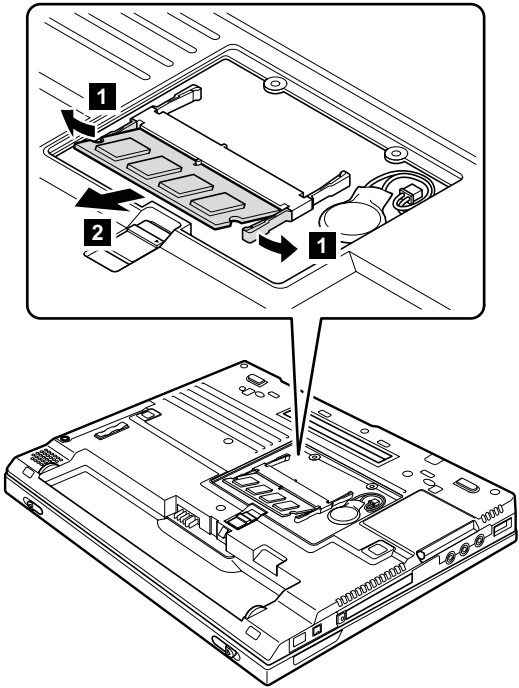
For X31 series



1040 DIMM

For access, remove following FRUs, in order:

- “1010 Battery pack” on page 71
- “1030 DIMM cover” on page 74



When installing: With the notched end of the DIMM toward the socket, insert the DIMM into the socket, and then press it firmly. Pivot the DIMM until it snaps into place. Make sure that the card is firmly fixed in the slot and does not move easily.

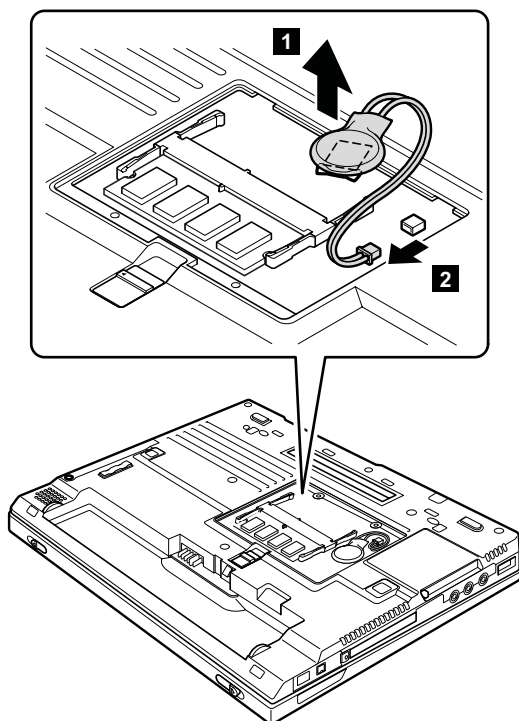
1050 Backup battery



Use only the battery specified in the parts list for your computer. The use of an incorrect battery can result in ignition or explosion of the battery.

For access, remove following FRUs, in order:

- “1010 Battery pack” on page 71
- “1020 Hard disk drive” on page 72
- “1030 DIMM cover” on page 74

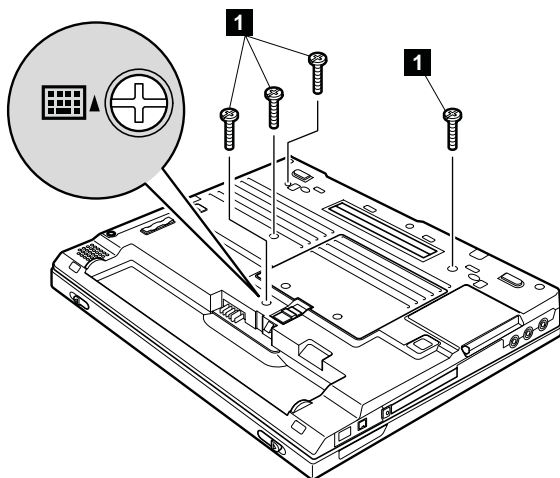


When installing: Make sure that the battery connector **4** is attached firmly.

1060 Keyboard

For access, remove following FRU:

- “1010 Battery pack” on page 71

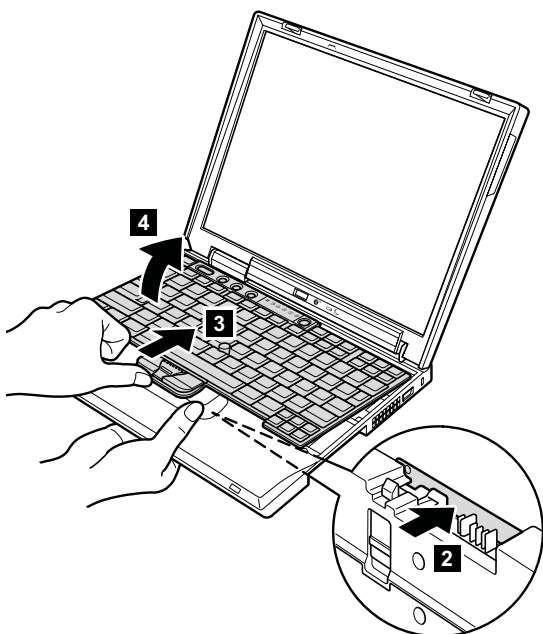


Step	Screw (quantity)	Torque
1	M2 × 6 mm, nylon-coated (4)	0.245 Nm (2.5 kgfcm)

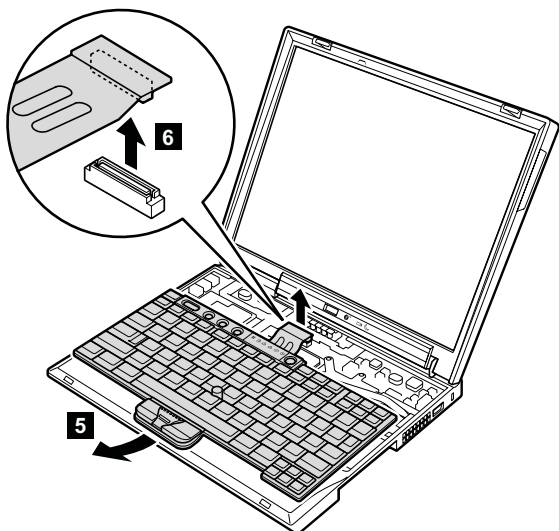
(continued)

Removing and replacing a FRU

In step **4**, open the keyboard slightly in the direction of the arrow.

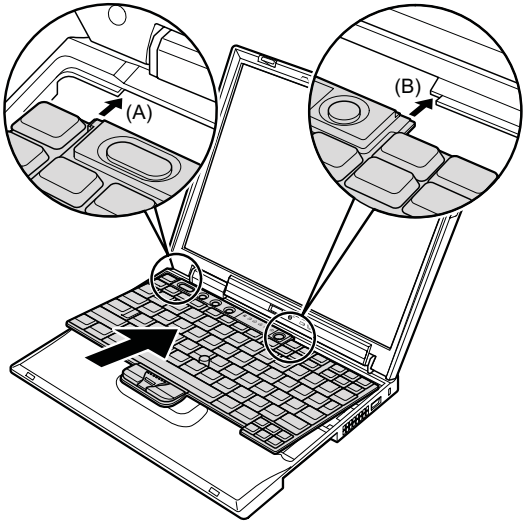


In step **5**, draw the keyboard a little in the direction of the arrow, and then detach the connector **6**.



When installing: Install the keyboard, do as follows;

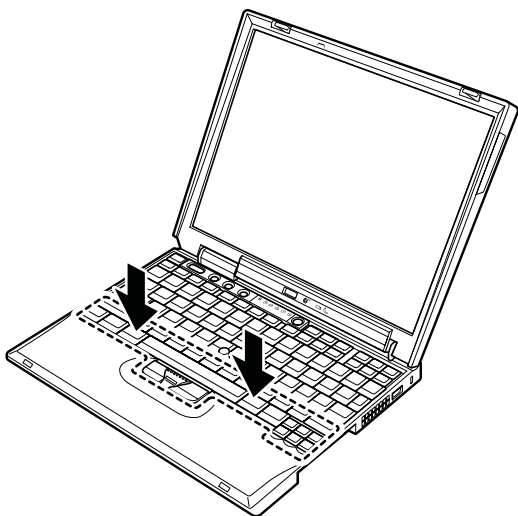
1. Attach the connector.
2. Make sure that the keyboard edges, shown in the figure as **(A)** and **(B)**, are under the frame.



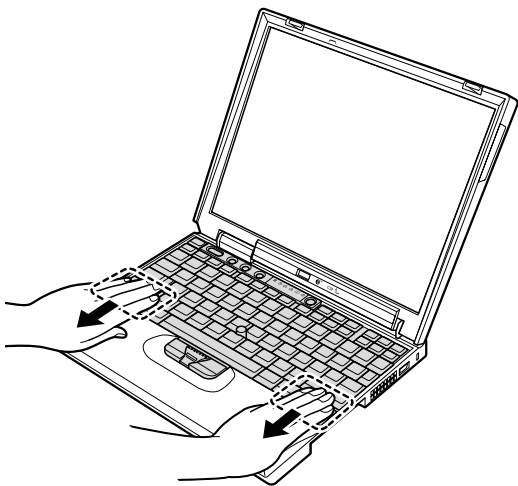
(continued)

Removing and replacing a FRU

3. Press the keys indicated by arrows to latch the keyboard firmly in place.



4. To make sure that the front side of the keyboard is housed firmly, gently press the keys with your thumbs and try to slide the keyboard toward you.



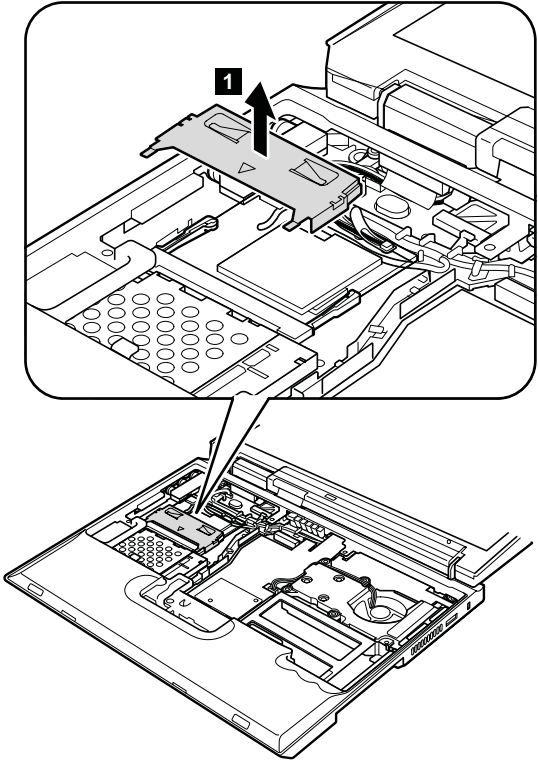
5. Secure the keyboard by tightening the screws from the bottom side of the computer.

1070 Mini PCI adapter

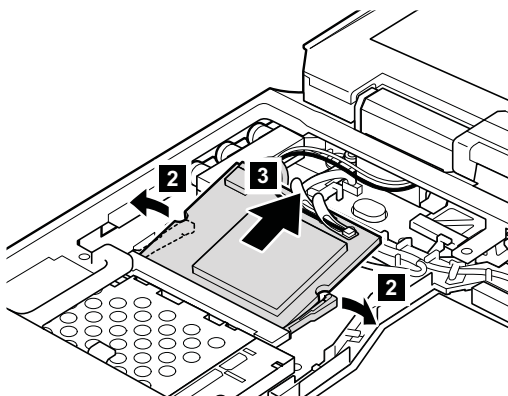
For access, remove following FRUs, in order:

- “1010 Battery pack” on page 71
- “1060 Keyboard” on page 77

802.11b wireless LAN/modem combo card

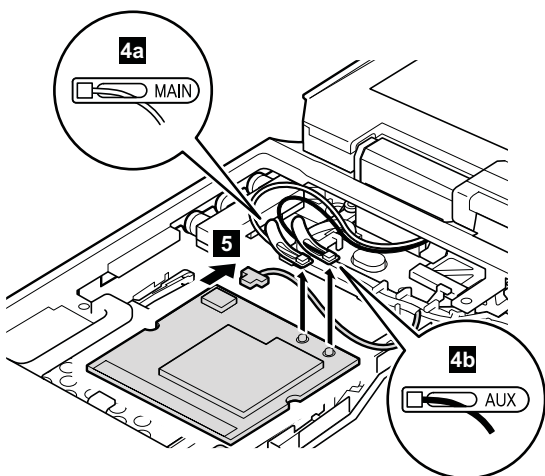


(continued)



Antenna cables **4a** and **4b** in the following illustration are for the wireless LAN feature, and **5** is for the modem feature.

Note: When unplugging the antenna jack, do not pull the cable; it might snap. Unplug the jack by pulling a tab with your fingers.

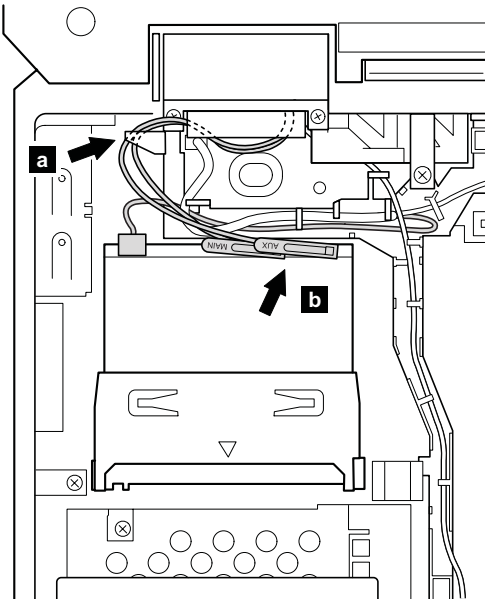


When installing:

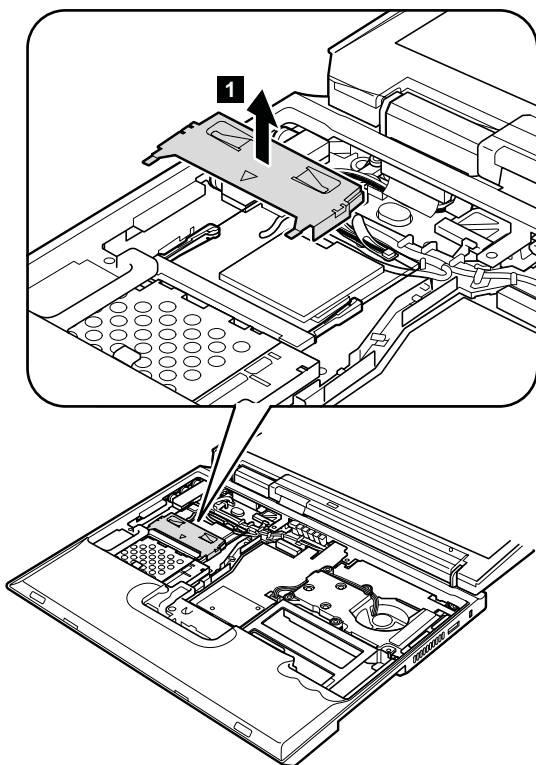
- Make sure that the connector **5** is firmly attached.
- Plug the gray antenna cable with the tab marked “MAIN” (**4a**) into jack *J1*, or *MAIN*, or *M*, and the black antenna cable with the tab marked “AUX” (**4b**) into jack *J2*, or *AUX*, or *A*.
- With the notched end of the card toward the socket, insert the card into the socket, and then press it firmly. Pivot the card until it snaps into place. Make sure that the card is firmly fixed in the slot and does not move easily.

Cable routing for the 802.11b/modem combo card

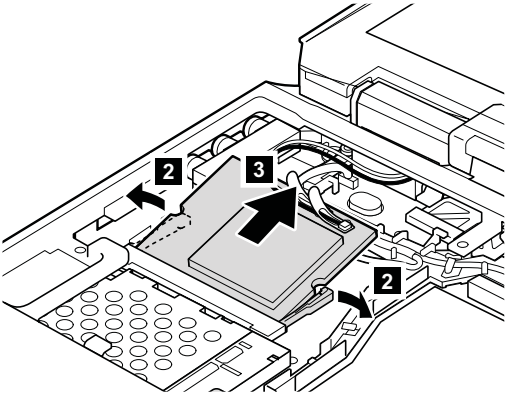
When attaching the Mini PCI adapter, route the antenna cables to go under the cable guide as in **a**, and place the tabs as indicated by arrow **b** in this figure.



802.11b wireless LAN card, 802.11a/b/g wireless LAN card

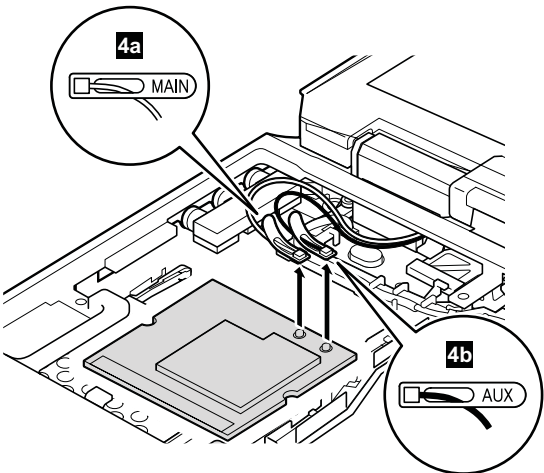


(continued)



Antenna cables **4a** and **4b** in the following illustration are for the wireless LAN feature.

Note: When unplugging the antenna jack, do not pull the cable; it might snap. Unplug the jack by pulling a tab with your fingers.



When installing:

- Plug the gray antenna cable with the tab marked “MAIN” (**4a**) into jack *J1*, or *MAIN*, or *M*, and the black antenna cable with the tab marked “AUX” (**4b**) into jack *J2*, or *AUX*, or *A*.
- With the notched end of the card toward the socket, insert the card into the socket, and then press it firmly. Pivot the card until it snaps into place. Make sure that the card is firmly fixed in the slot and does not move easily.

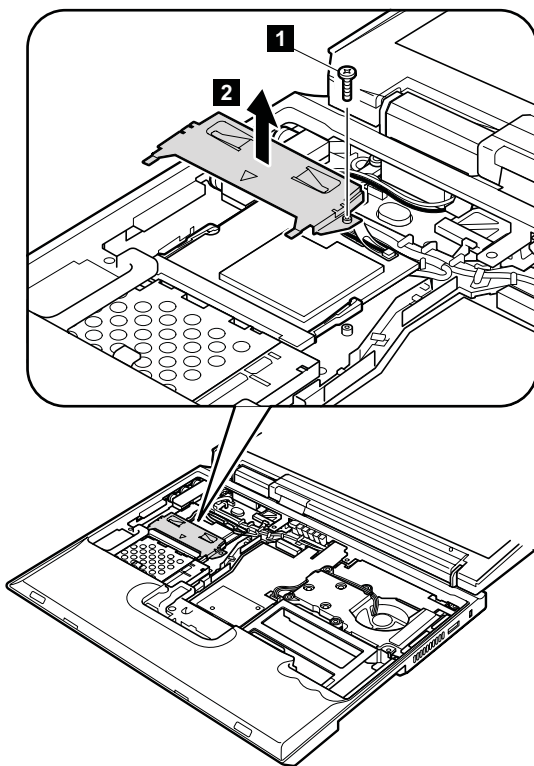
802.11a/b wireless LAN card

Note

This procedure is not applicable for the following model. For the model, the removal procedure is same as in “802.11b wireless LAN card, 802.11a/b/g wireless LAN card” on page 84 though the model supports 802.11a/b wireless LAN card.

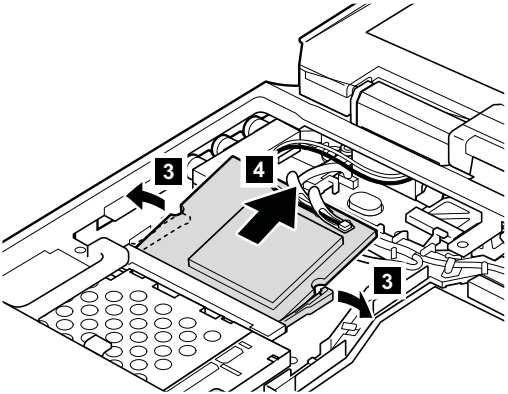
- 2672-JHJ

Note: This FRU is secured by using a tamper resistant torx head screw (TR7).



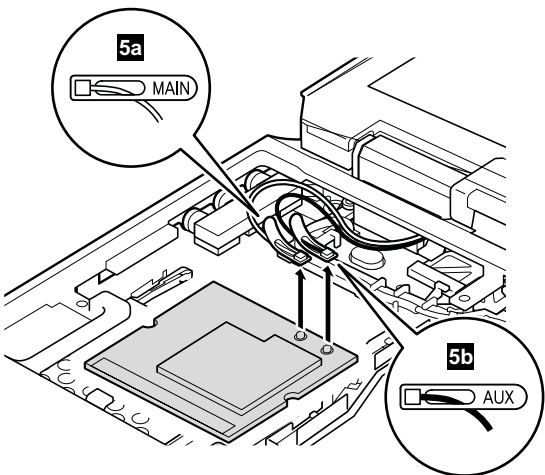
Step	Screw (quantity)	Torque
1	M2 × 3 mm, TR7, nylon-coated (1)	0.245 Nm (2.5 kgfcm)

(continued)



Antenna cables **5a** and **5b** in the following illustration are for the wireless LAN feature.

Note: When unplugging the antenna jack, do not pull the cable; it might snap. Unplug the jack by pulling a tab with your fingers.

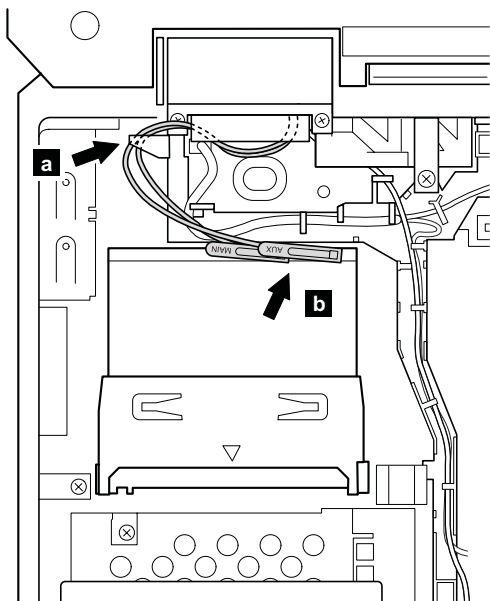


When installing:

- Plug the gray antenna cable with the tab marked “MAIN” (**5a**) into jack *J1*, or *MAIN*, or *M*, and the black antenna cable with the tab marked “AUX” (**5b**) into jack *J2*, or *AUX*, or *A*.
- With the notched end of the card toward the socket, insert the card into the socket, and then press it firmly. Pivot the card until it snaps into place. Make sure that the card is firmly fixed in the slot and does not move easily.

Cable routing for the 802.11b wireless LAN or 802.11a/b wireless LAN card

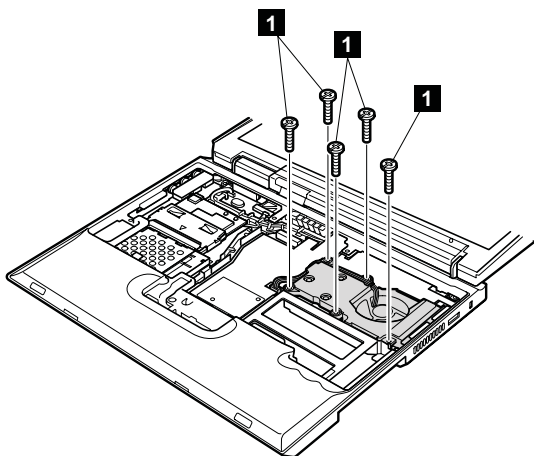
When attaching the Mini PCI adapter, route the antenna cables to go under the cable guide as in **a**, and place the tabs as indicated by arrow **b** in this figure.



1080 Fan assembly

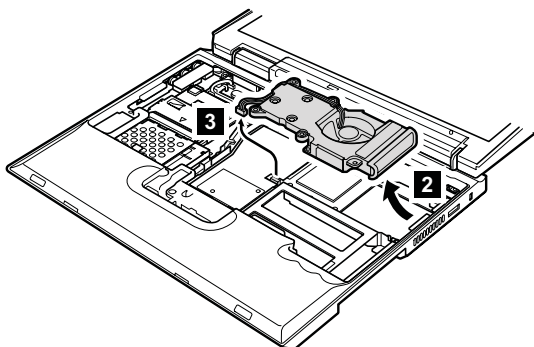
For access, remove following FRUs, in order:

- “1010 Battery pack” on page 71
- “1020 Hard disk drive” on page 72
- “1060 Keyboard” on page 77



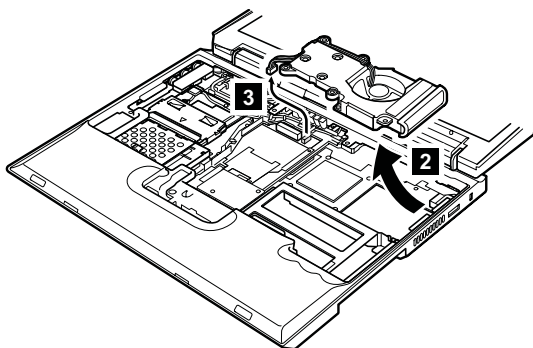
Step	Screw (quantity)	Torque
1	M2 × 9.5 mm, nylon-coated (5)	0.245 Nm (2.5 kgfcm)

For X30 series



(continued)

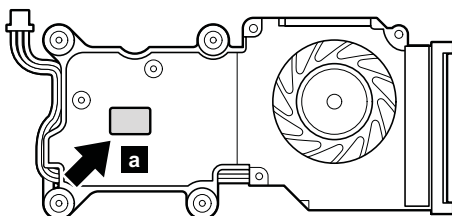
For X31 series



When installing: Make sure that the connector **3** is firmly attached.

Note

Apply thermal grease on the **a** -part of the fan, shown in the following figure.



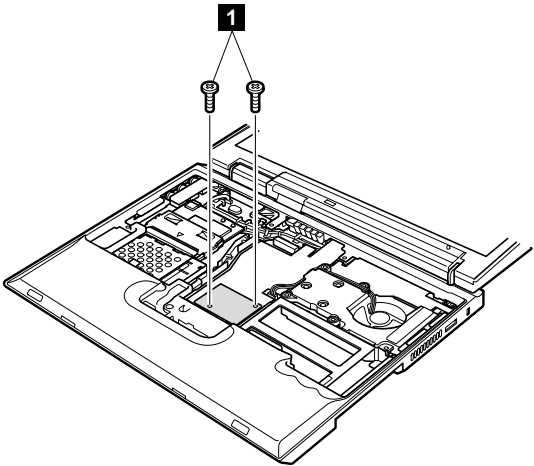
1090 Communication daughter card (CDC)

Note

In X30 series, the CDC slot on some models accepts a Modem Daughter Card (MDC). On other models, the slot accepts a *Bluetooth* Daughter Card (BDC). In X31 series, the CDC slot on some models accepts a Modem Daughter Card (MDC). On other models, the slot accepts a *Bluetooth/Modem* Daughter Card (BMDC).

For access, remove following FRUs, in order:

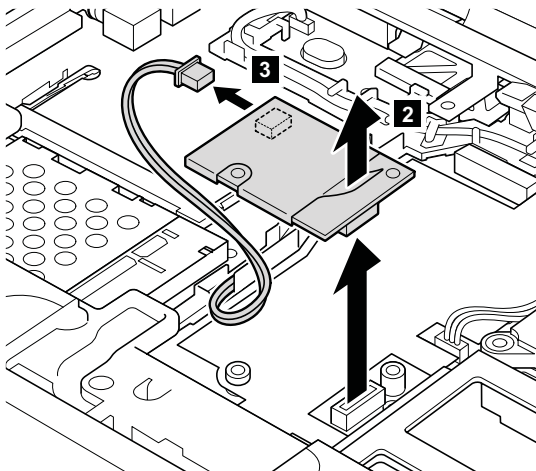
- “1010 Battery pack” on page 71
- “1020 Hard disk drive” on page 72
- “1060 Keyboard” on page 77



Step	Screw (quantity)	Torque
1	M2 × 9.5 mm, nylon-coated (2)	0.245 Nm (2.5 kgfcm)

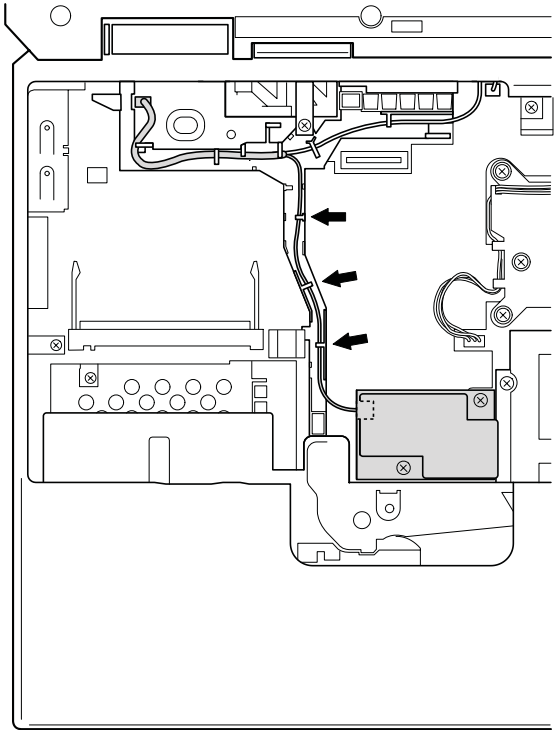
(continued)

Modem daughter card (MDC)

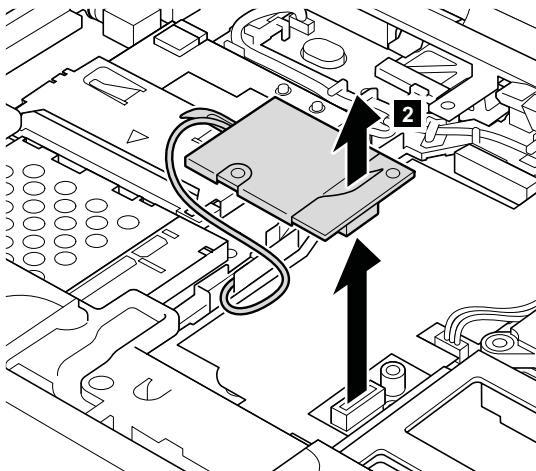


When installing: Make sure that connectors **2** and **3** are attached firmly.

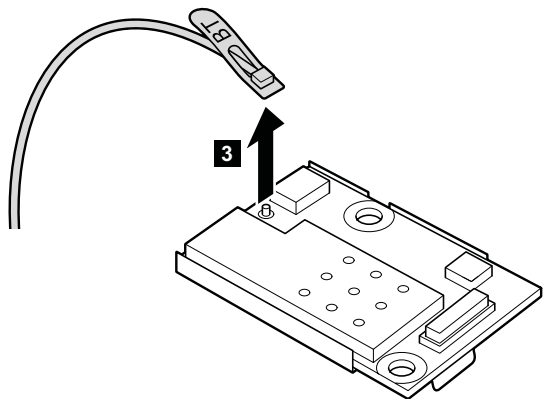
Cable routing: When attaching the MDC, route the cable along the cable guides as indicated by the arrows in this figure.



Bluetooth daughter card (BDC)



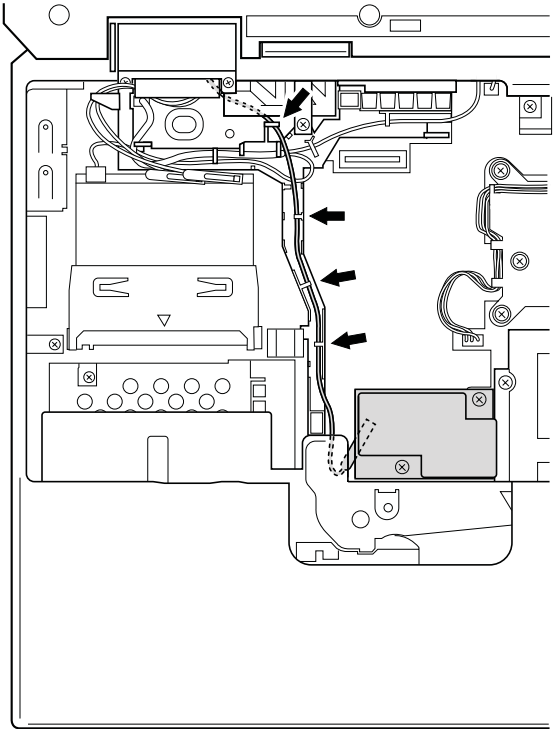
Note: When unplugging the *Bluetooth* wireless antenna jack, do not pull the cable; it might snap. Unplug the jack by pulling the tab with your fingers.



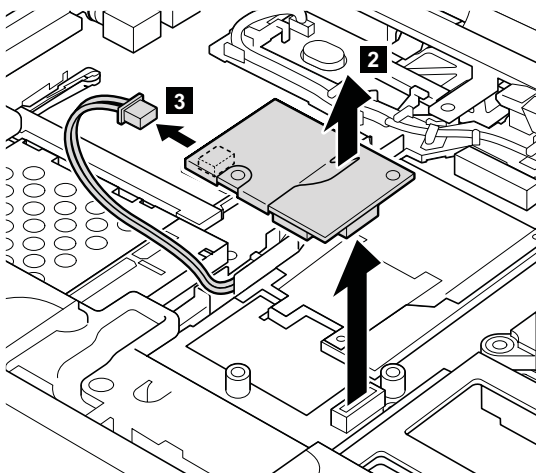
When installing:

1. Plug the white cable with the tab marked “BT” into the jack on the BDC.
2. Make sure that the connector **2** is attached firmly.

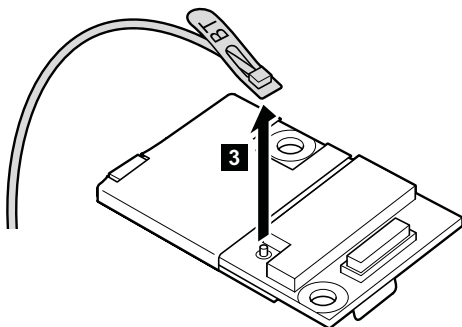
Cable routing: When attaching the BDC, route the cable along the cable guides as indicated by the arrows in this figure.



Bluetooth/Modem daughter card (BMDC)



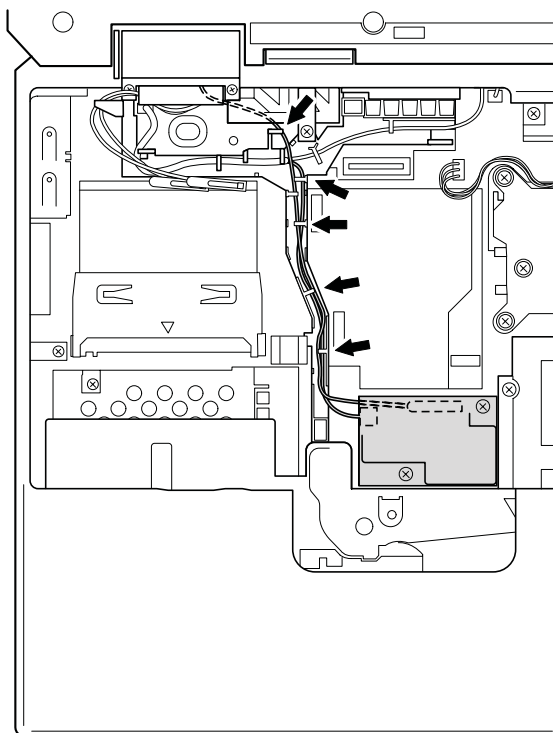
Note: When unplugging the *Bluetooth* wireless antenna jack, do not pull the cable; it might snap. Unplug the jack by pulling the tab with your fingers.



When installing:

1. Plug the white cable with the tab marked “BT” into the jack on the BMDC.
2. Make sure that the connectors **2** and **3** are attached firmly.

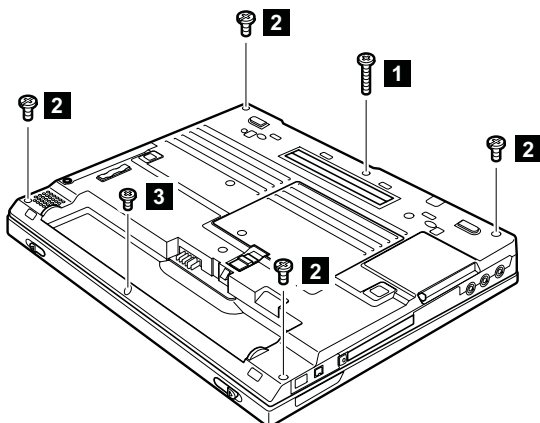
Cable routing: When attaching the BDC, route the cable along the cable guides as indicated by the arrows in this figure.



1100 Keyboard bezel

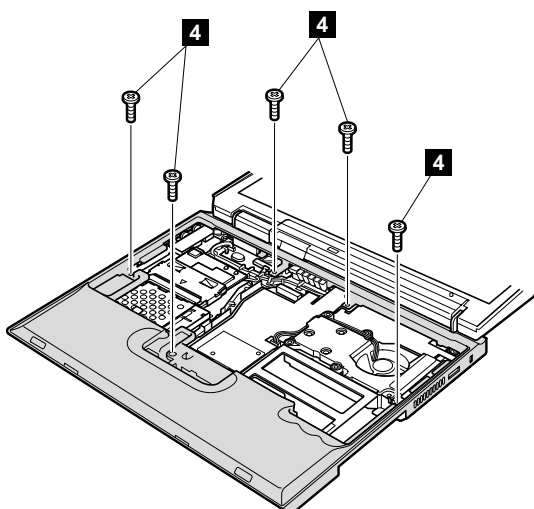
For access, remove following FRUs, in order:

- “1010 Battery pack” on page 71
- “1020 Hard disk drive” on page 72
- “1030 DIMM cover” on page 74
- “1040 DIMM” on page 75
- “1050 Backup battery” on page 76
- “1060 Keyboard” on page 77

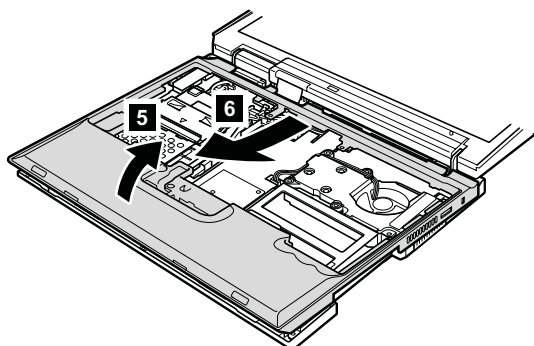


Step	Screw (quantity)	Torque
1	M2 × 13.5 mm, nylon-coated (1)	0.245 Nm (2.5 kgfcm)
2	M2 × 6 mm, nylon-coated (4)	0.245 Nm (2.5 kgfcm)
3	M2 × 4 mm, nylon-coated (1)	0.245 Nm (2.5 kgfcm)

(continued)



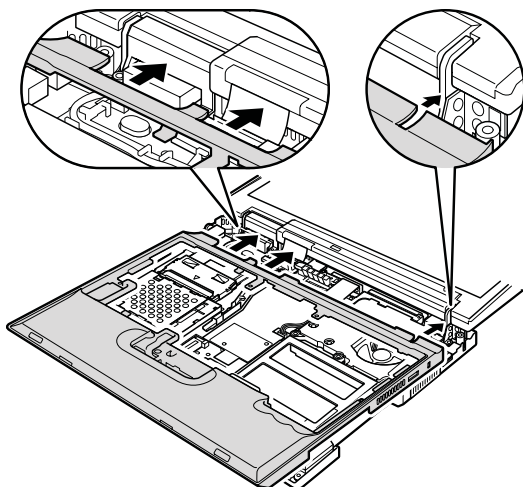
Step	Screw (quantity)	Torque
4	M2 × 4 mm, nylon-coated (5)	0.245 Nm (2.5 kgfcm)



(continued)

When installing the keyboard bezel, do the following:

1. Attach the keyboard bezel to the computer, aligning the two dents of the bezel with the hinges as shown in this figure.

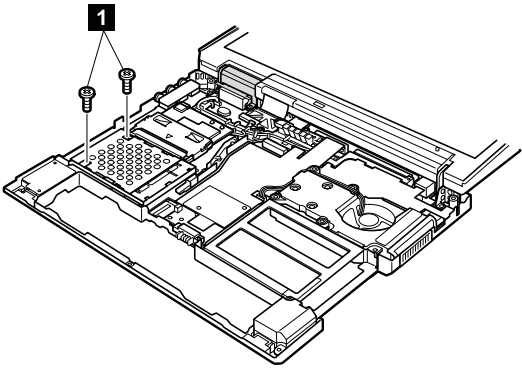


2. Make sure that all of the latches on the front side of the computer are attached firmly.
3. Secure the keyboard bezel with the screws.

1110 PC card slot

For access, remove following FRUs, in order:

- “1010 Battery pack” on page 71
- “1020 Hard disk drive” on page 72
- “1030 DIMM cover” on page 74
- “1040 DIMM” on page 75
- “1050 Backup battery” on page 76
- “1060 Keyboard” on page 77
- “1100 Keyboard bezel” on page 98

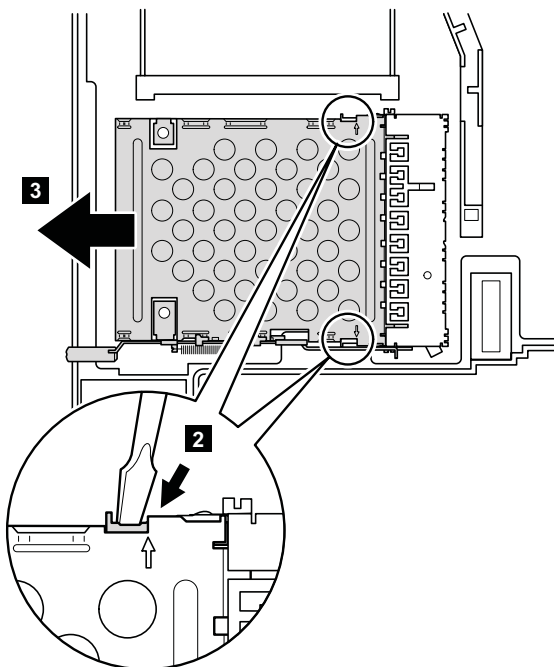


Step	Screw (quantity)	Torque
1	M2 × 4 mm, nylon-coated (2)	0.245 Nm (2.5 kgfcm)

(continued)

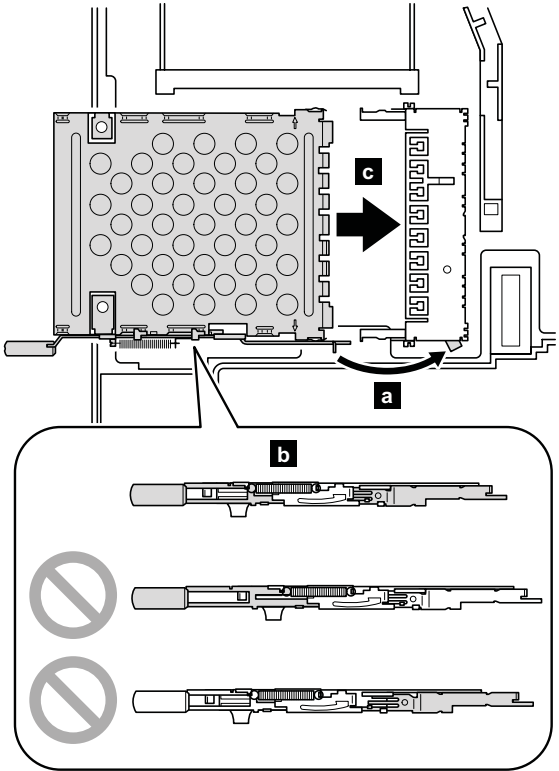
Removing and replacing a FRU

Unlatch the PC Card slot by pressing the two parts indicated by arrow **2**, and then remove the slot in the direction of arrow **3**.



When installing:

1. Make sure that stroke arm (**a**) is placed as indicated by the arrow.
2. Make sure that the eject lever on the front side of the slot is as **b** in this figure.
3. Attach the slot in the direction of arrow **c** , and make sure that both of the latches are attached firmly.
4. Secure the slot with the screws.

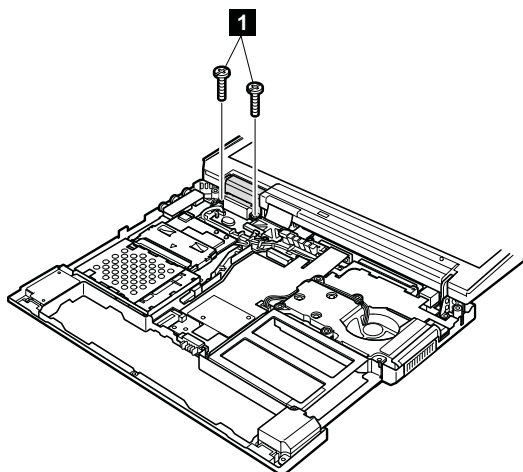


1120 Hinge cover and LCD assembly

For access, remove following FRUs, in order:

- “1010 Battery pack” on page 71
- “1020 Hard disk drive” on page 72
- “1030 DIMM cover” on page 74
- “1040 DIMM” on page 75
- “1050 Backup battery” on page 76
- “1060 Keyboard” on page 77
- “1070 Mini PCI adapter” on page 81
- “1100 Keyboard bezel” on page 98

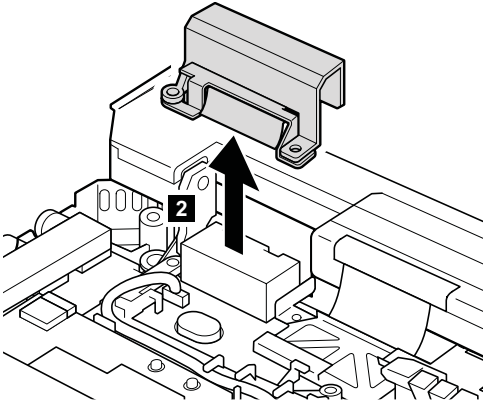
Before removing the LCD assembly, remove the hinge cover first by following steps **1** and **2**.



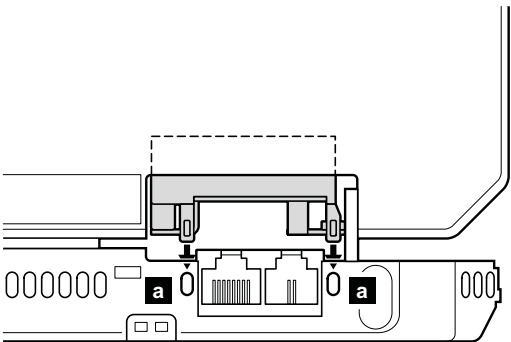
Step	Screw (quantity)	Torque
1	M2 × 9.5 mm, nylon-coated (2)	0.245 Nm (2.5 kgfcm)

(continued)

The *Bluetooth* wireless antenna assembly is attached to the hinge cover in some models. For those models, undo the *Bluetooth* wireless antenna cable from the cable guides. And then remove the hinge cover and the *Bluetooth* wireless antenna assembly together in the direction of arrow **2**.

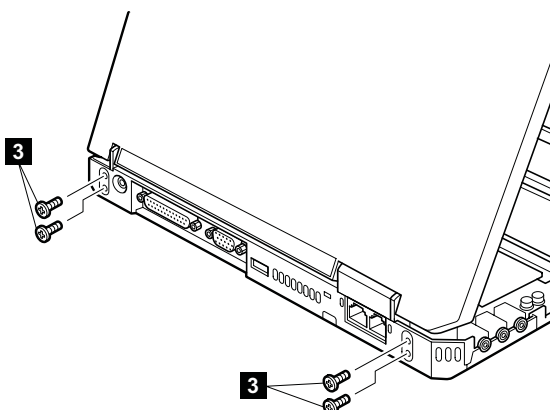


When installing: Attach the hinge cover, aligning the two projections on the rear side with the two small square holes in the base cover. (**a**)

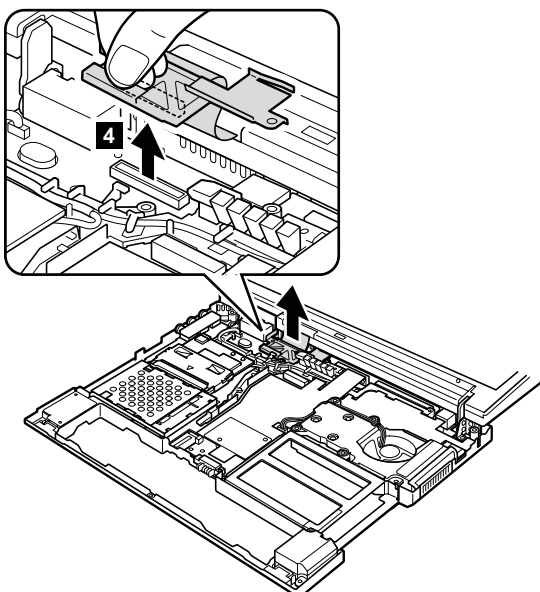


Removing and replacing a FRU

After removing the hinge cover, remove the LCD assembly as follows:

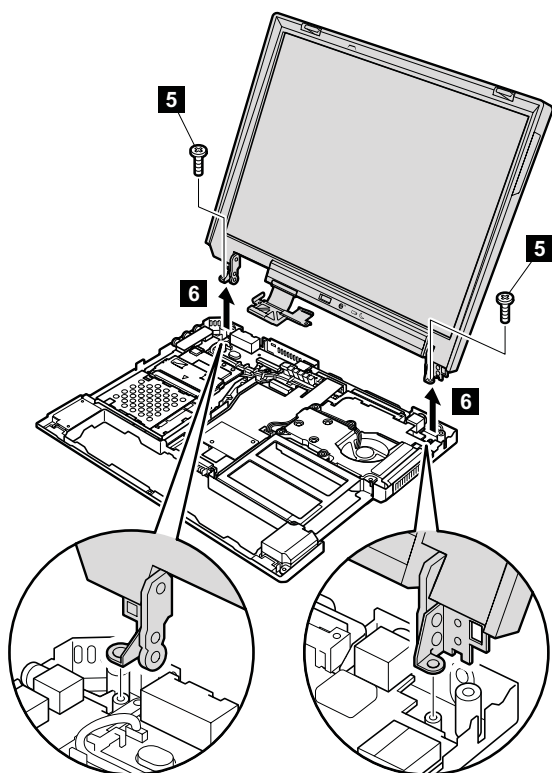


Step	Screw (quantity)	Torque
3	M2.5 × 4.8 mm, nylon-coated (4)	0.392 Nm (4 kgfcm)



When installing: Make sure that the connector **4** is firmly attached.

(continued)



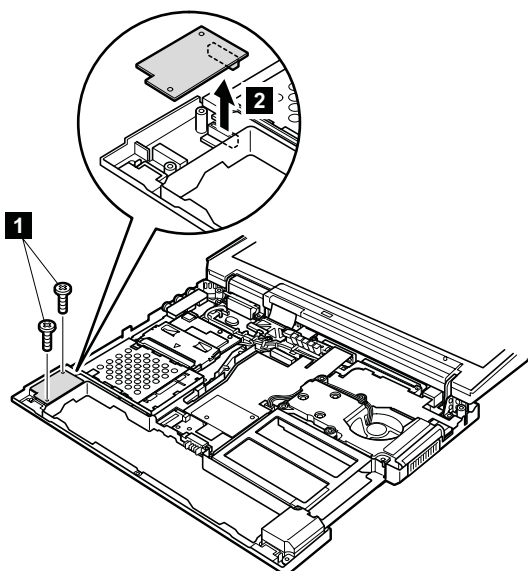
Step	Screw (quantity)	Torque
5	M2.5 × 4.8 mm, nylon-coated (2)	0.392 Nm (4 kgfcm)

Cable routing: After attaching the LCD assembly, route the antenna cables as follows:

1130 Sub card assembly

For access, remove following FRUs, in order:

- “1010 Battery pack” on page 71
- “1020 Hard disk drive” on page 72
- “1030 DIMM cover” on page 74
- “1040 DIMM” on page 75
- “1050 Backup battery” on page 76
- “1060 Keyboard” on page 77
- “1100 Keyboard bezel” on page 98



Step	Screw (quantity)	Torque
1	M2 × 4 mm, nylon-coated (2)	0.245 Nm (2.5 kgfcm)

When installing: Make sure that the connector **2** on the bottom side of the card is firmly attached to the system board.

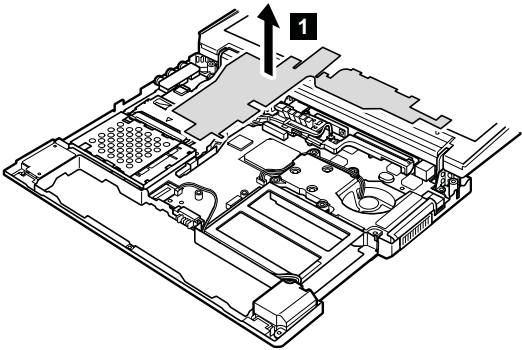
1140 Speaker assembly

For access, remove following FRUs, in order:

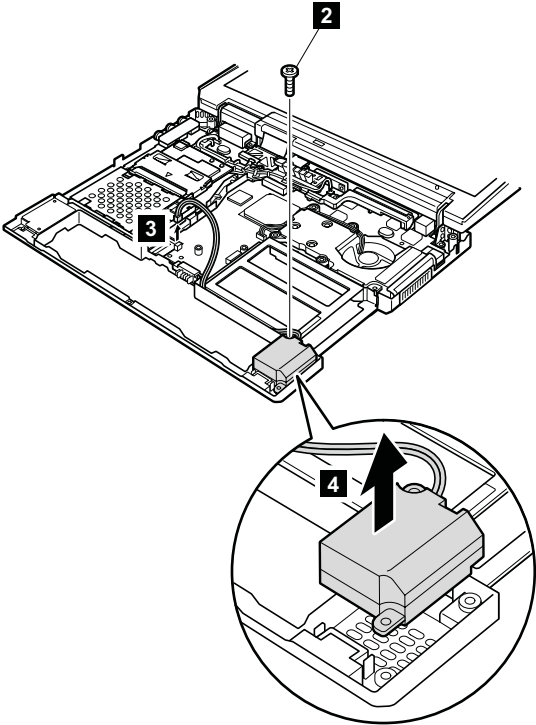
- “1010 Battery pack” on page 71
- “1020 Hard disk drive” on page 72
- “1030 DIMM cover” on page 74
- “1040 DIMM” on page 75
- “1050 Backup battery” on page 76
- “1060 Keyboard” on page 77
- “1090 Communication daughter card (CDC)” on page 91 (only for the models with the CDC)
- “1100 Keyboard bezel” on page 98

Note: Step **1** is only for the X30 series. For the X31 series, skip this step.

Before removing the speaker assembly, remove the keyboard CRU insulator **1**.



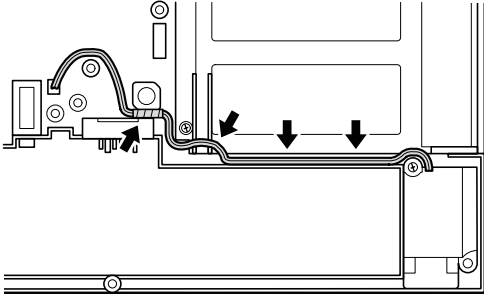
(continued)



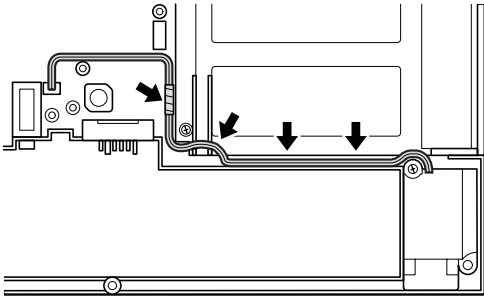
Step	Screw (quantity)	Torque
2	M2 × 14 mm with washer, nylon-coated (1)	0.245 Nm (2.5 kgfcm)

Cable routing: When installing the speaker assembly, attach the connector first. Then route the cable along the cable guides of the base cover as indicated by the arrows in this picture.

For X30 series



For X31 series

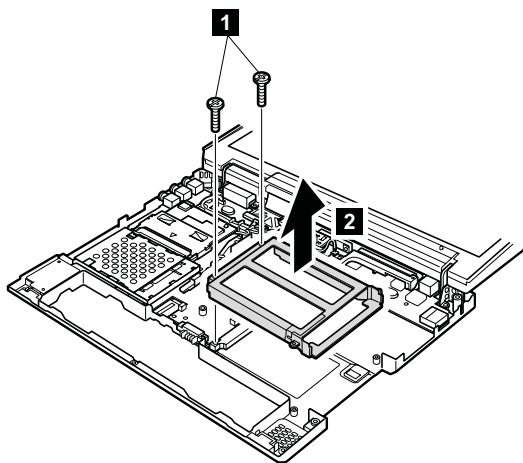


1150 System board and base cover

For access, remove following FRUs, in order:

- “1010 Battery pack” on page 71
- “1020 Hard disk drive” on page 72
- “1030 DIMM cover” on page 74
- “1040 DIMM” on page 75
- “1050 Backup battery” on page 76
- “1060 Keyboard” on page 77
- “1070 Mini PCI adapter” on page 81
- “1080 Fan assembly” on page 89
- “1090 Communication daughter card (CDC)” on page 91
- “1100 Keyboard bezel” on page 98
- “1110 PC card slot” on page 101
- “1120 Hinge cover and LCD assembly” on page 104
- “1130 Sub card assembly” on page 108
- “1140 Speaker assembly” on page 109

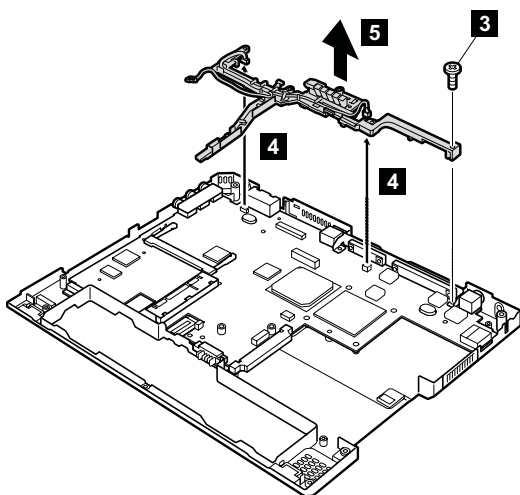
Before removing the system board, remove the hard disk drive holder (steps **1** and **2**) and the cable guide (steps **3** to **5**).



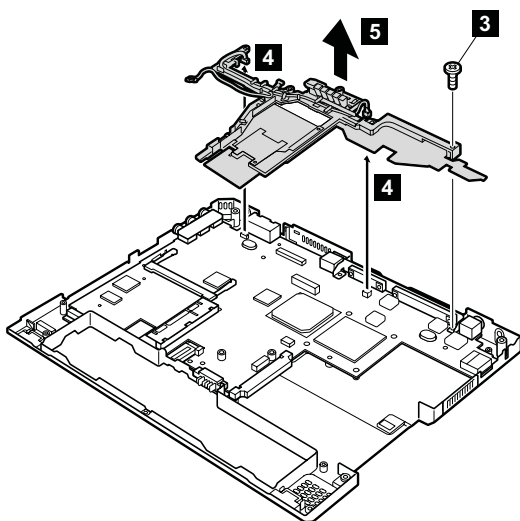
Step	Screw (quantity)	Torque
1	M2 × 9.5 mm, nylon-coated (2)	0.245 Nm (2.5 kgfcm)

(continued)

For X30 series



For X31 series

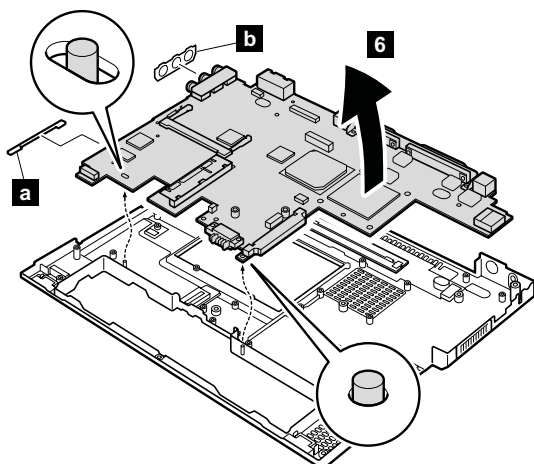


Step	Screw (quantity)	Torque
3	M2 × 9.5 mm, nylon-coated (1)	0.245 Nm (2.5 kgfcm)

When installing: Make sure that the connectors **4** are attached firmly.

(continued)

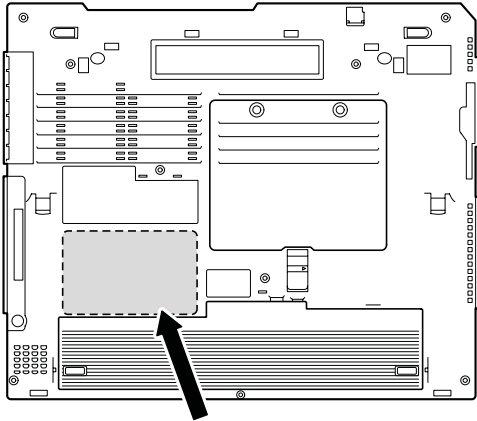
PC Card guide (**a**) and audio connector retainer (**b**) are attached to the system board. When you replace the system board, reinstall those parts to the new system board FRU.



When installing: Attach the system board so that the two small projections on the base cover fit into the holes provided, and then tighten the screws.

For X31 series

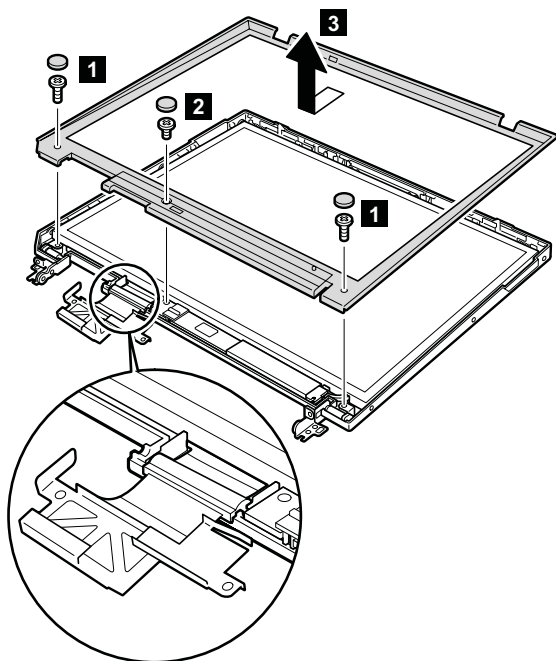
When you order a new base cover, you also need to order the label kit. Check the FRU no. on both FRUs first and order them at same time. Stick the label kit on the new base cover as indicated in the following figure.



2010 LCD front bezel

For access, remove following FRUs, in order:

- “1010 Battery pack” on page 71
- “1020 Hard disk drive” on page 72
- “1030 DIMM cover” on page 74
- “1040 DIMM” on page 75
- “1050 Backup battery” on page 76
- “1060 Keyboard” on page 77
- “1100 Keyboard bezel” on page 98
- “1120 Hinge cover and LCD assembly” on page 104



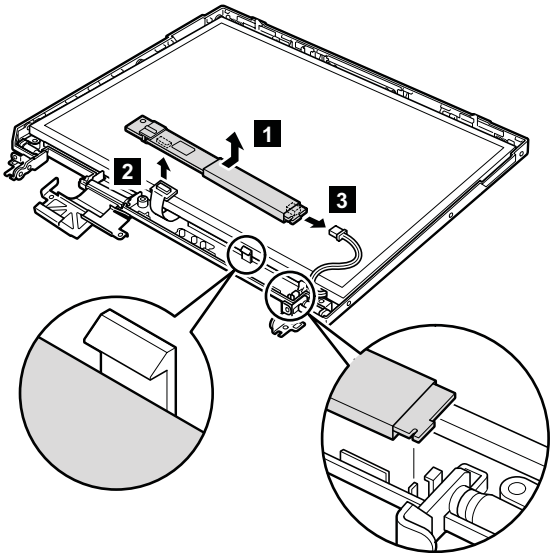
Step	Screw (quantity)	Torque
1	M2.5 × 4.8 mm, nylon-coated (2)	0.392 Nm (4 kgfcm)
2	M2 × 4 mm, nylon-coated (1)	0.245 Nm (2.5 kgfcm)

When installing: Make sure that all of the latches of the LCD front bezel are firmly attached to the LCD cover. Then secure the bezel with the screws.

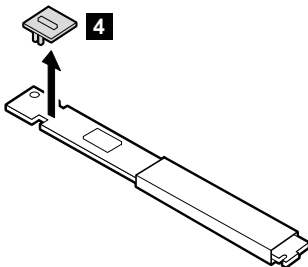
2020 Inverter card

For access, remove following FRUs, in order:

- “1010 Battery pack” on page 71
- “1020 Hard disk drive” on page 72
- “1030 DIMM cover” on page 74
- “1040 DIMM” on page 75
- “1050 Backup battery” on page 76
- “1060 Keyboard” on page 77
- “1100 Keyboard bezel” on page 98
- “1120 Hinge cover and LCD assembly” on page 104
- “2010 LCD front bezel” on page 116



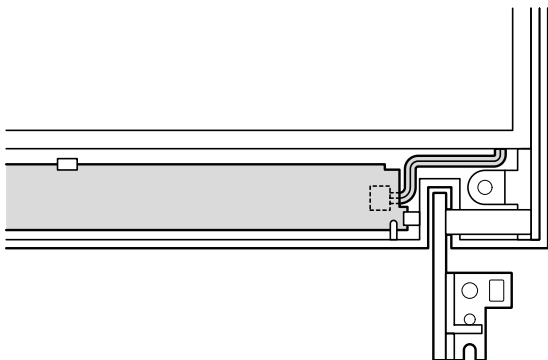
If the ThinkPad computer you are servicing has the *Bluetooth* wireless features, remove *Bluetooth* button cover **4** from the defective inverter card and keep the cover for reuse.



When installing:

1. If the ThinkPad computer you are servicing has the *Bluetooth* wireless features, reattach the *Bluetooth* button cover before you install the new inverter card FRU to the computer.
2. Make sure that both of the connectors **2** , **3** are attached firmly.

Cable routing: When replacing the inverter card, route the connector cable as in the following figure:

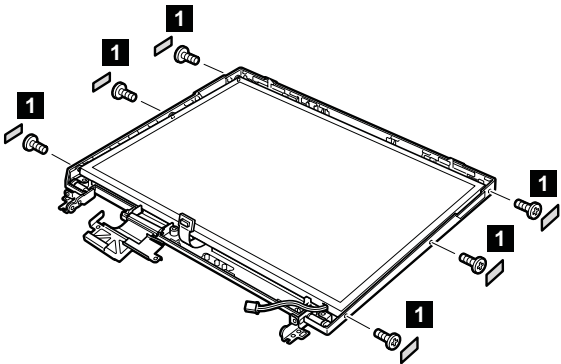


2030 LCD panel

For access, remove following FRUs, in order:

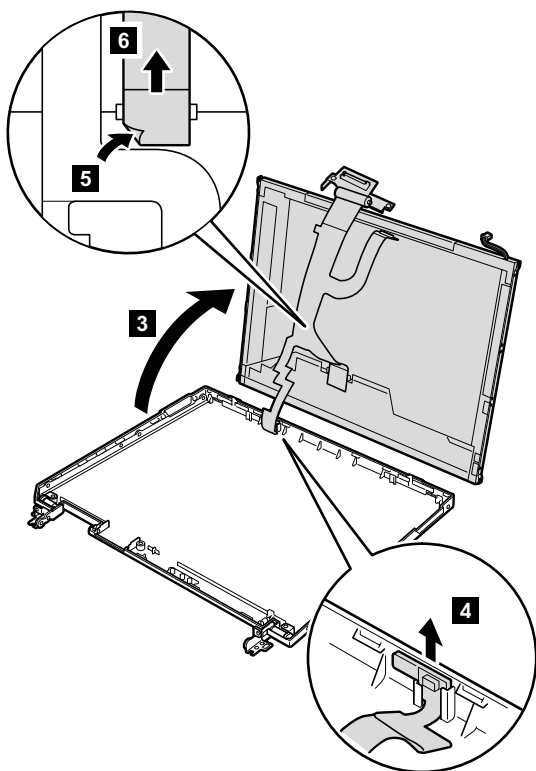
- “1010 Battery pack” on page 71
- “1020 Hard disk drive” on page 72
- “1030 DIMM cover” on page 74
- “1040 DIMM” on page 75
- “1050 Backup battery” on page 76
- “1060 Keyboard” on page 77
- “1100 Keyboard bezel” on page 98
- “1120 Hinge cover and LCD assembly” on page 104
- “2010 LCD front bezel” on page 116
- “2020 Inverter card” on page 117

For models with no wireless LAN antenna

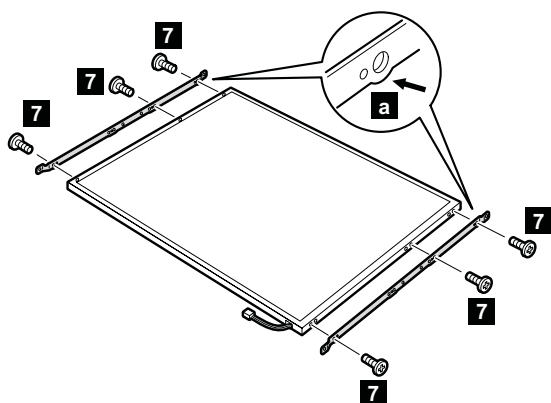


Step	Screw (quantity)	Torque
1	M2 × 4 mm, nylon-coated (6)	0.245 Nm (2.5 kgfcm)

(continued)



(continued)

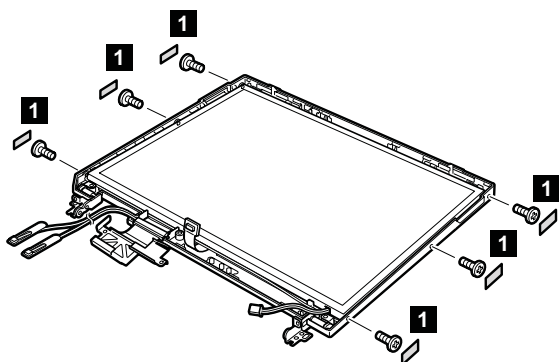


Step	Screw (quantity)	Torque
7	M2 × 3 mm, nylon-coated (6)	0.2 Nm (2 kgfcm)

When installing

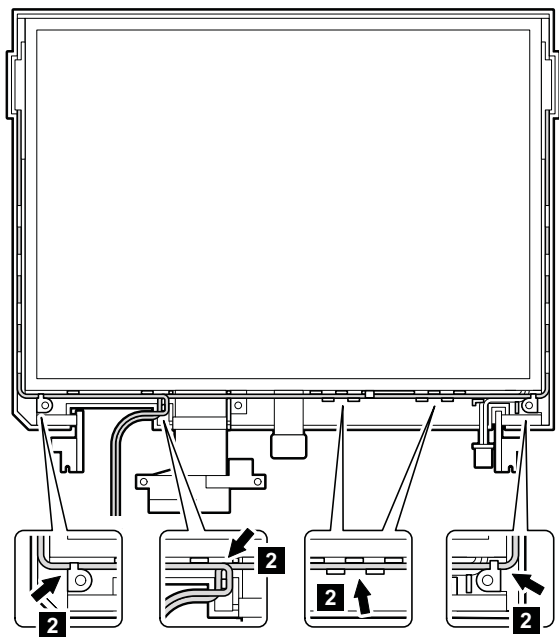
- Do not pinch the antenna cables under the LCD panel.
- Make sure that the antenna cables are firmly routed along the cable guides of the LCD cover.

For wireless LAN models

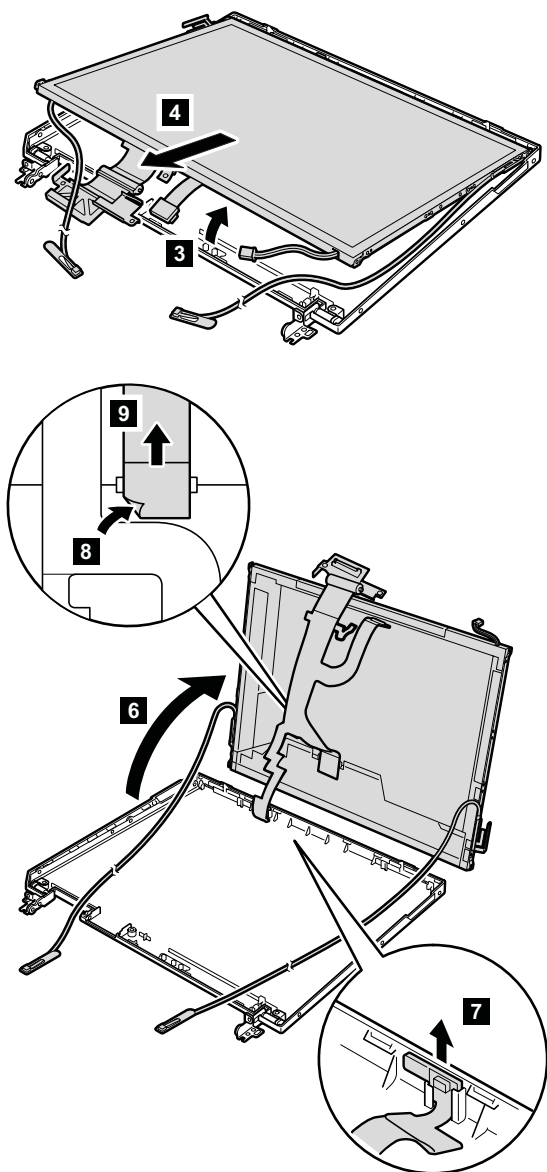


Step	Screw (quantity)	Torque
1	M2 × 4 mm, nylon-coated (6)	0.245 Nm (2.5 kgfcm)

Release the antenna cables from the cable guides indicated by the arrows **2** in this figure.

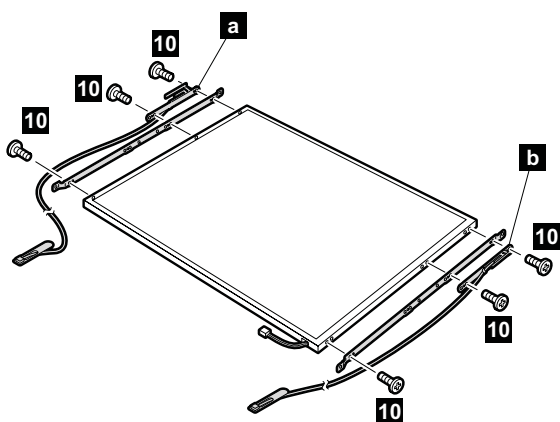


(continued)



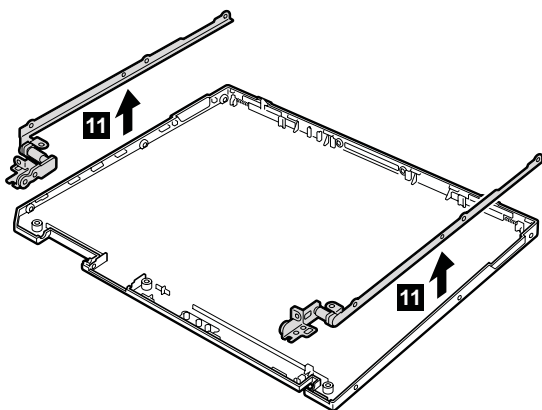
(continued)

Attention: Do not bend the metal part of the wireless LAN antenna.



Step	Screw (quantity)	Torque
10	M2 × 3 mm, nylon-coated (6)	0.245 Nm (2.5 kgfcm)

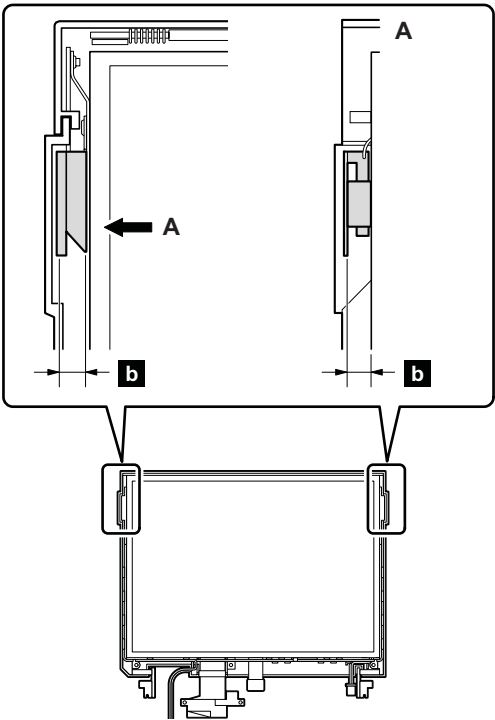
When installing: Attach the white cable **a** to the right bracket, and attach the black cable **b** to the left bracket.



(continued)

When installing:

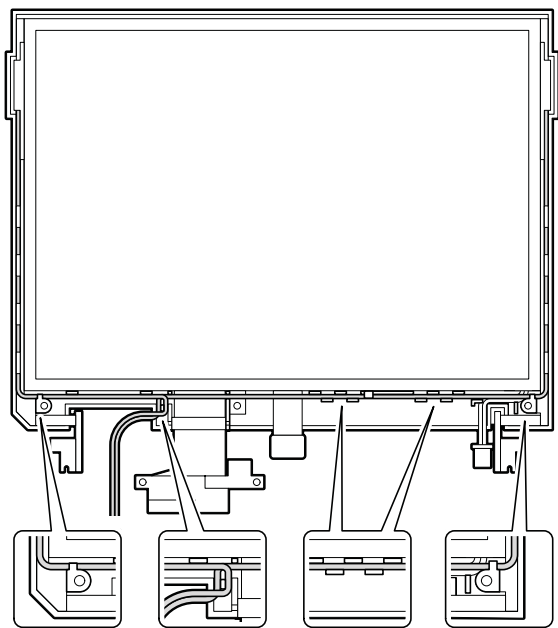
- Make sure that the metal plate of the antenna is not bent.
- The antenna must be placed as in this figure (**b** should be parallel.)



- Place the FPC connector to pass under the black antenna cable.
 - Do not pinch the antenna cables under the LCD panel.
- (continued)

Removing and replacing a FRU

- Make sure that the antenna cables are firmly routed along the cable guides of the LCD cover.

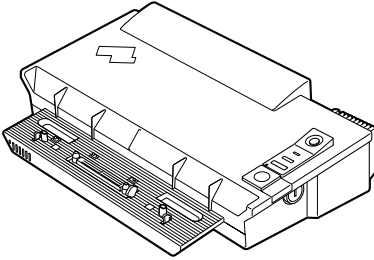


3010 ThinkPad Dock PCI cover

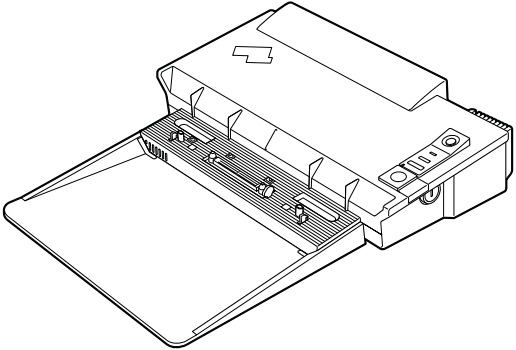
Before replacing the PCI cover:

There are two types of ThinkPad Dock, as follows:

- ThinkPad Dock: FRU no. 08N1546 (PCI cover: FRU no. 05K6246)

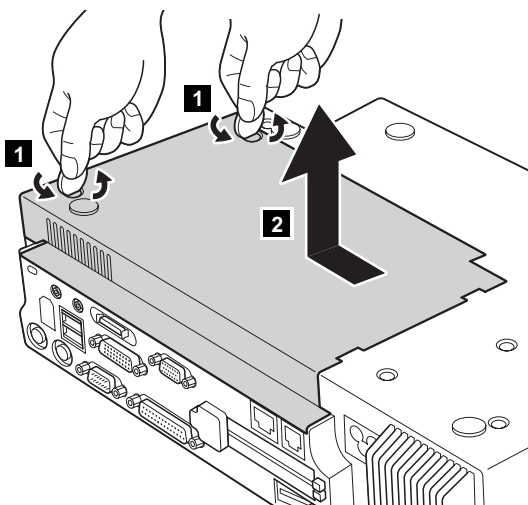


- ThinkPad Dock with extension plate: FRU no. 08N1537 (PCI cover: FRU no. 08N7317)



Confirm the FRU no. of the ThinkPad Dock first and choose the proper PCI cover FRU for the ThinkPad Dock you are servicing.

Note: The following illustration shows how to remove the PCI cover of ThinkPad Dock (FRU no. 08N1546). Do the same to remove the PCI cover of ThinkPad Dock with extension plate (FRU no. 08N1537).

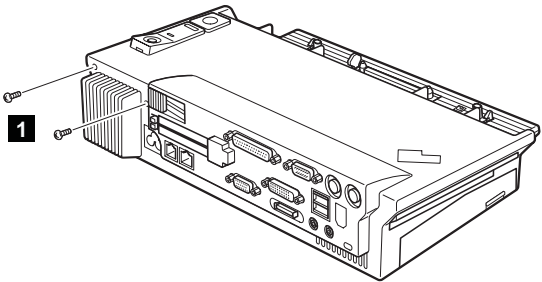


(Bottom view)

3020 ThinkPad Dock top cover

Note

This section is only for the ThinkPad Dock (FRU no. 08N1546). The top cover and screw kit for ThinkPad Dock (FRU no. 12P4143) is not available for the ThinkPad Dock with extension plate (FRU no. 08N1537) .

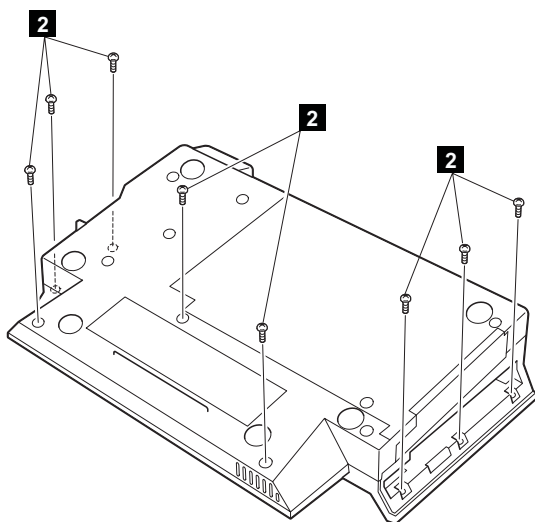


(Rear view)

Step	Screw (quantity)	Torque
1	M2.5 × 4.8 mm (2)	0.392 Nm (4 kgfcm)

(continued)

Removing and replacing a FRU

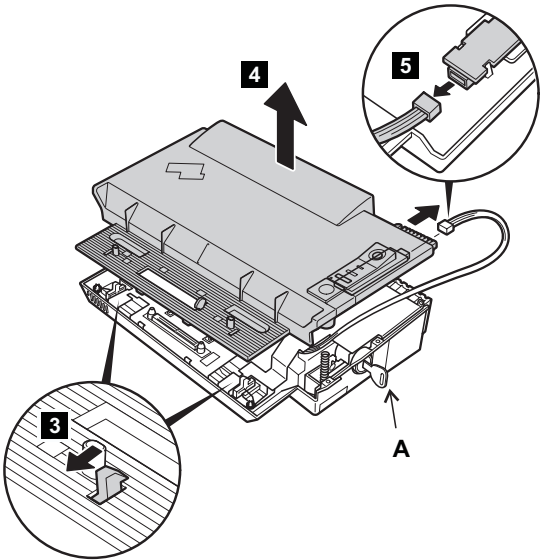


(Bottom view)

Step	Screw (quantity)	Torque
2	M2.5 × 4.8 mm (8)	0.392 Nm (4 kgfcm)

(continued)

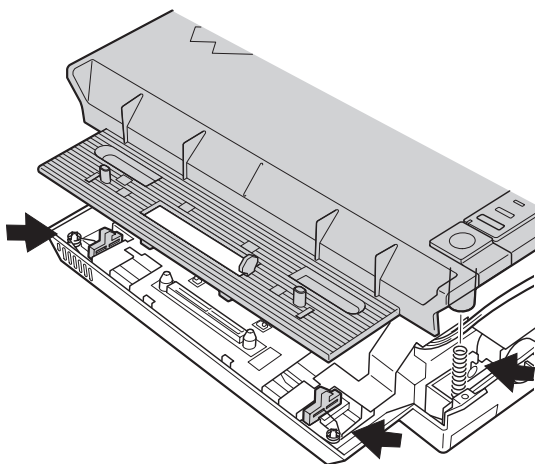
Make sure that the system lock key **A** is set to the Unlock position. Release the front latches in step **3**, and then remove the top cover **4**. For step **5**, see the inside view, shown in the circle.



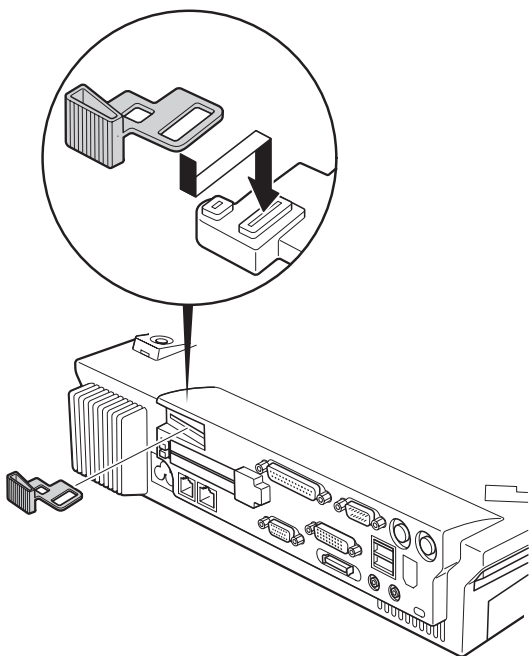
Removing and replacing a FRU

When replacing the top cover, do the following:

- Make sure that the springs are placed correctly.

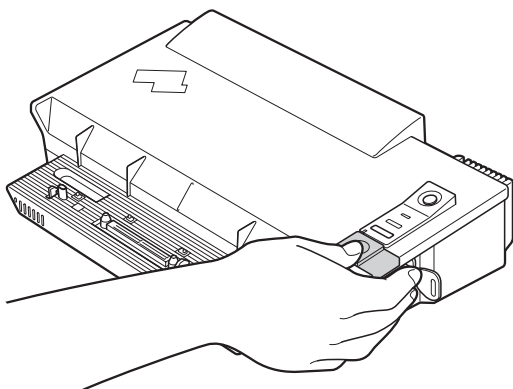


- Make sure that the device release lever is seated correctly.

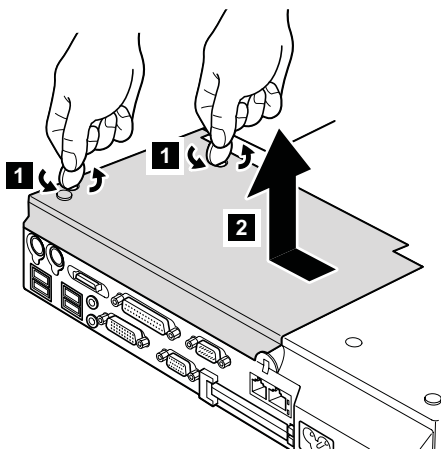


(continued)

- Make sure that the release button works correctly.

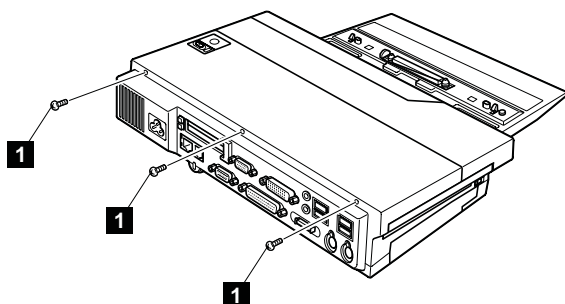


4010 ThinkPad Dock II PCI cover



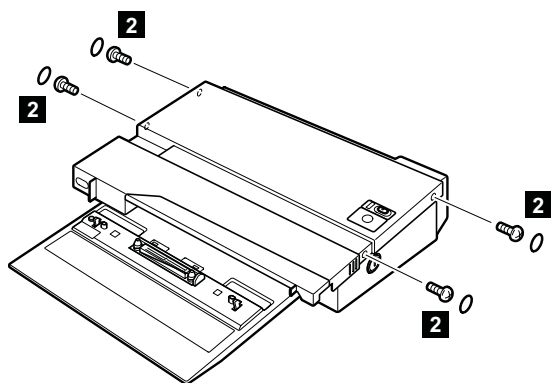
(Bottom view)

4020 ThinkPad Dock II top cover



(Rear view)

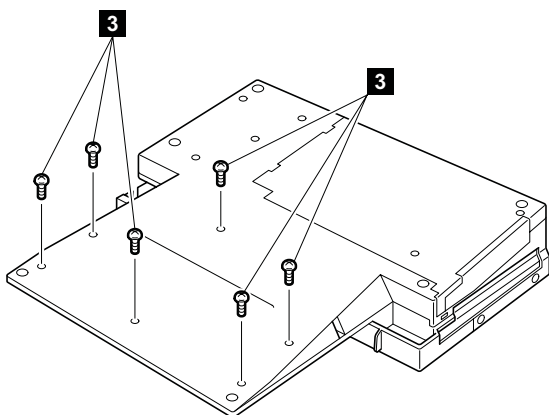
Step	Screw (quantity)	Torque
1	M2.5 × 4.8 mm (3)	0.392 Nm (4 kgfcm)



Step	Screw (quantity)	Torque
2	M2.5 × 4.8 mm (4)	0.392 Nm (4 kgfcm)

(continued)

Removing and replacing a FRU

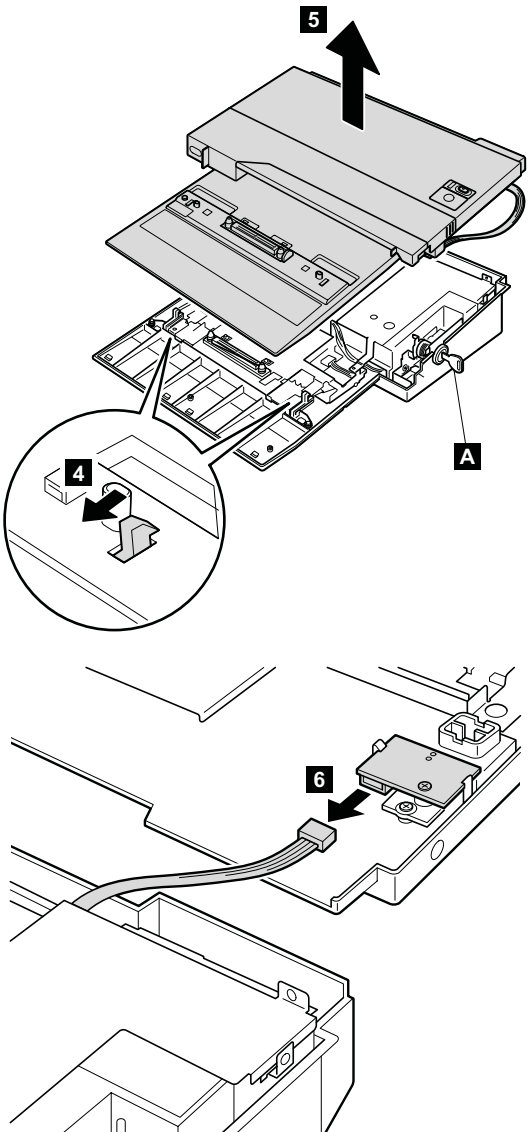


(Bottom view)

Step	Screw (quantity)	Torque
3	M2.5 × 4.8 mm (6)	0.392 Nm (4 kgfcm)

(continued)

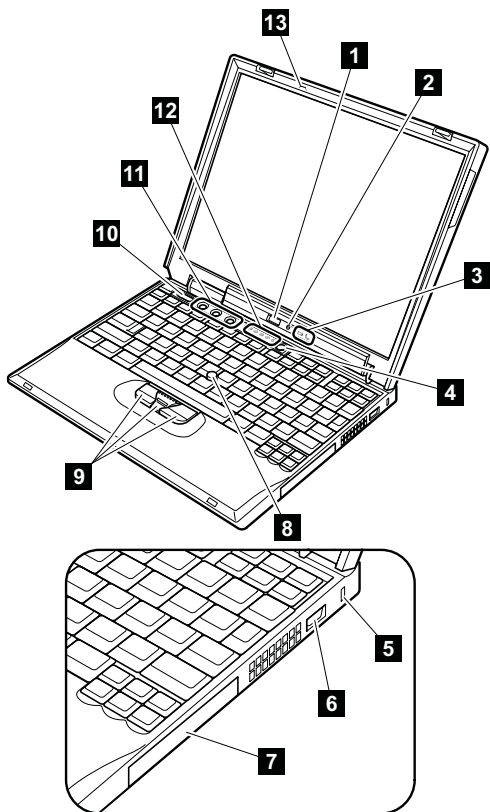
Make sure that the system lock key **A** is set to the Unlock position. Release the front latches in step **4**, and then remove the top cover **5**. Then detach the connector cable **6** as in the figure.



Locations

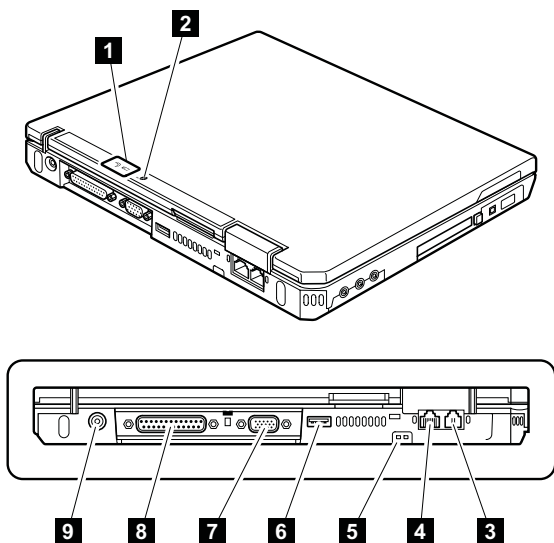
Front view for X30 series

- | | |
|-----------|--|
| 1 | <i>Bluetooth button (some models)</i> |
| 2 | <i>Bluetooth wireless status indicator (some models)</i> |
| 3 | Power status indicators |
| 4 | Power switch |
| 5 | Security keyhole |
| 6 | Universal serial bus (USB) connector |
| 7 | Hard disk drive |
| 8 | TrackPoint pointer |
| 9 | TrackPoint buttons |
| 10 | ThinkPad button |
| 11 | Volume and mute buttons |
| 12 | System status indicators |
| 13 | ThinkLight |



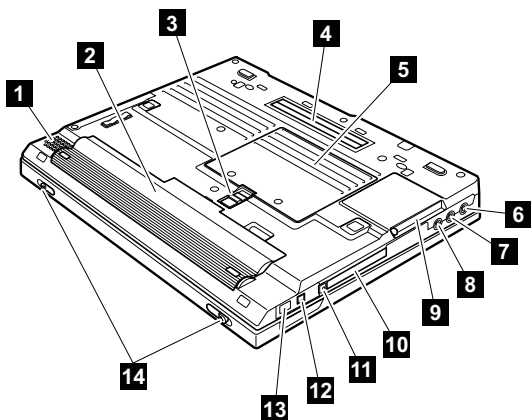
Rear view for X30 series

- 1** Power status indicators
- 2** *Bluetooth* wireless status indicator (some models)
- 3** Modem connector
- 4** Ethernet connector
- 5** Ethernet status indicator
- 6** USB connector
- 7** External-monitor connector
- 8** Parallel connector
- 9** AC power connector



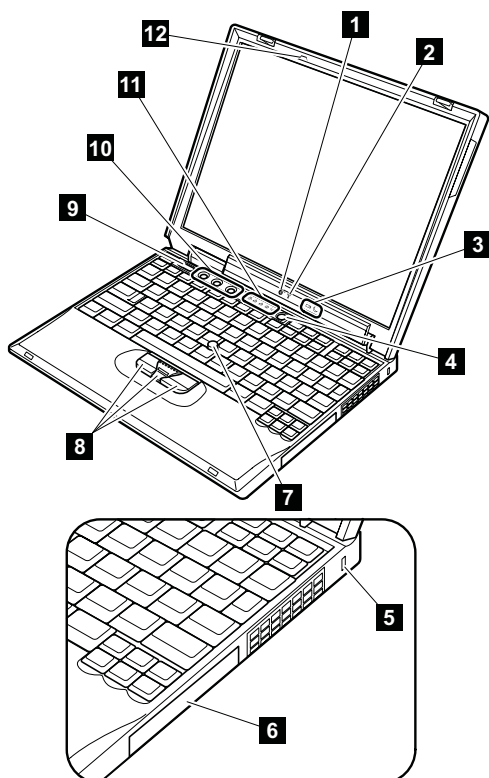
Bottom view for X30 series

- 1** Built-in speaker
- 2** Battery pack
- 3** Battery pack latches
- 4** Docking connector
- 5** DIMM slots
- 6** Stereo headphone jack
- 7** Stereo line-in jack
- 8** Microphone jack
- 9** CompactFlash card slot or Infrared port
- 10** PC Card slot
- 11** PC Card eject button
- 12** IEEE 1394 connector
- 13** Infrared port
- 14** LCD latches



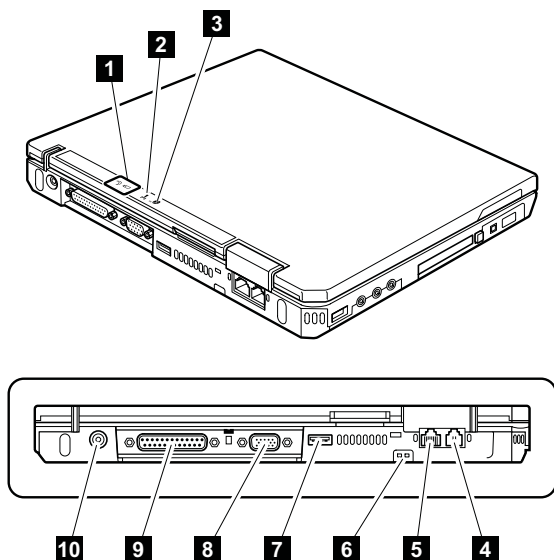
Front view for X31 series

- 1** *Bluetooth* wireless status indicator (some models)
- 2** Wireless status indicator
- 3** Power status indicators
- 4** Power switch
- 5** Security keyhole
- 6** Hard disk drive
- 7** TrackPoint pointer
- 8** TrackPoint buttons
- 9** ThinkPad button
- 10** Volume and mute buttons
- 11** System status indicators
- 12** ThinkLight



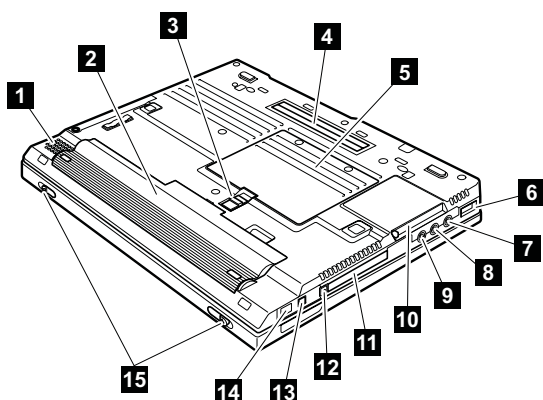
Rear view for X31 series

- 1** Power status indicators
- 2** Wireless status indicator
- 3** *Bluetooth* wireless status indicator (some models)
- 4** Modem connector
- 5** Ethernet connector
- 6** Ethernet status indicators
- 7** USB connector
- 8** External-monitor connector
- 9** Parallel connector
- 10** AC power connector



Bottom view for X31 series

- 1** Built-in speaker
- 2** Battery pack
- 3** Battery pack latches
- 4** Docking connector
- 5** DIMM slots
- 6** Universal serial bus (USB) connector
- 7** Stereo headphone jack
- 8** Stereo line-in jack
- 9** Microphone jack
- 10** CompactFlash card slot or Infrared port
- 11** PC Card slot
- 12** PC Card eject button
- 13** IEEE 1394 connector
- 14** Infrared port
- 15** LCD latches

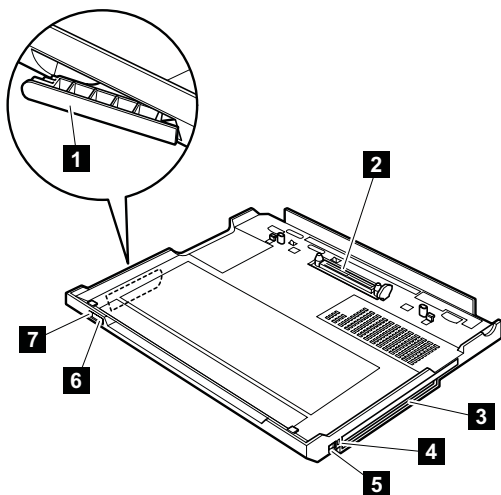


Locations for UltraBase X3

Some models are shipped with a ThinkPad X3 UltraBase. For those models, refer the following locations.

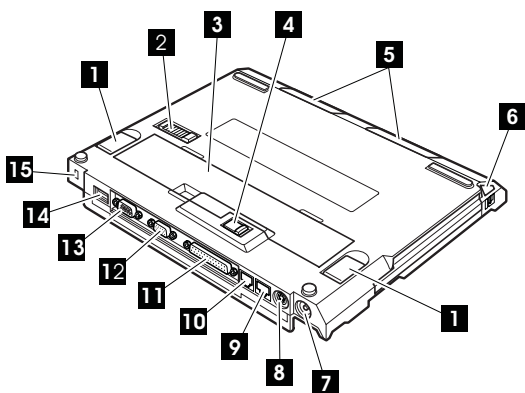
Front view

- 1** UltraBase X3 release lever
- 2** Docking connector
- 3** Ultrabay Plus
Note: The Ultrabay Plus accepts several storage devices, such as a DVD drive or a CD-ROM drive, and also accepts an Ultrabay Plus carrier.
- 4** Ultrabay status indicator
Green: An Ultrabay device is attached to the computer and in use.
Turn off: An Ultrabay device is ready to be attached or detached.
- 5** Ultrabay device eject lever
- 6** UltraBase eject button
- 7** UltraBase status indicator
Green: An UltraBase X3 is attached to the computer and in use.
Turn off: An UltraBase X3 is ready to be attached or detached.



Bottom view

- 1** Foot
- 2** UltraBase latches
- 3** Battery bay
- 4** Battery pack latches
- 5** Built-in stereo speakers
- 6** Ultrabay device eject lever
- 7** AC power connector
- 8** Keyboard or mouse connector
- 9** Ethernet connector
- 10** Modem connector
- 11** Parallel connector
- 12** External monitor connector
- 13** Serial connector
- 14** USB connector
- 15** Security keyhole



Parts list

X30 and X31 series model matrix

The X30 and X31 series include several models. The following tables summarize the characteristics of each model, to help you determine which FRU in the part list meets your need.

Model	CDC	Mini PCI adapter	LCD	Bay device for UltraBase	CPU		
X30: memory, 128 MB (PC133); HDD, 20 GB (4200 rpm)							
2672-11x, 12x	MDC	—	12.1-in. XGA	—	Tual 1.06 G		
2672-1Ax, 1Bx ^{SC}	—	802.11b/modem	12.1-in. XGA with antenna				
X30: memory, 256 MB (PC133); HDD, 20 GB (4200 rpm)							
2672-31x, 32x, 33x	MDC	—	12.1-in. XGA	—	Tual 1.06 G		
X30: memory, 256 MB (PC133); HDD, 40 GB (4200 rpm)							
2672-7MT	MDC	—	12.1-in. XGA	—	Tual 1.06 G		
2672-76x							
2672-41x, 42x, 43x, 45x, 46x, 47x					Tual 1.2 G		
2673-42x							
2672-4Nx, 4Px, 4Qx				DVD-ROM			
2672-4Xx ^{SC}		802.11b (Cisco)	12.1-in. XGA with antenna	—			
2672-4Ax, 4Bx, 4Cx, 4Ex ^{SC}	802.11b/modem	802.11b/modem					
2673-4Bx ^{SC}		DVD-ROM					
2672-4Rx, 4Sx, 4Tx ^{SC}							
2672-4Fx, 4Gx, 4Hx, 4Jx ^{SC}	BDC			—			
2672-4Vx ^{SC}				DVD-ROM			

(continued)

Model	CDC	Mini PCI adapter	LCD	Bay device for UltraBase	CPU
X31: memory, 256 MB (PC2100); HDD, 20 GB (4200 rpm)					
2672-B1x, B2x, B3x	MDC	—	12.1-in. XGA with antenna	—	Ban 1.3G
2884-BNx ^{SC}					
2672-BLx, BMx				CD-ROM	
2884-B5U ^{SC}				DVD-ROM	
2884-BSU ^{SC}		802.11b (Intel)		—	
2672-BAx, BBx, BCx, 2884-BRx ^{SC}					
X31: memory, 256 MB (PC2700); HDD, 30 GB (4200 rpm)					
2672-G1x, G2x, G3x	MDC	—	12.1-in. XGA with antenna	—	Ban 1.4G
2672-27x, 2884-2Nx ^{SC}					
2672-GLx, GMx				CD-ROM	
2884-25x ^{SC}				DVD-ROM	
2672-2Bx, GAx, GBx, GCx ^{SC}		802.11b (Intel)		—	Ban 1.5G
2672-39x ^{SC}		—			
2672-3Lx ^{SC}		802.11b (Intel)			
2672-3Ux ^{SC}		802.11 b/g			
X31 memory, 256 MB (PC2100); HDD, 40 GB (4200 rpm)					
2672-FQx	MDC	—	12.1-in. XGA with antenna	DVD-ROM	Ban 1.3G
2672-F2x, F3x				—	
2672-C1x, C3x					Ban 1.4G
2672-C2x, C6x, 2673-C2x, 2890-C2x, 2891-C2x ^{SC}					
2672-CPx, CQx				DVD-ROM	
2672-C8x, CAx, CBx, 2673-CBx, 2884-CRx ^{SC}		802.11b (Intel)		—	
2672-CDx, CEx, CFx ^{SC}		BMDC			

(continued)

Model	CDC	Mini PCI adapter	LCD	Bay device for UltraBase	CPU		
X31: memory, 256 MB (PC2100); HDD, 40 GB (4200 rpm)							
2672-CKx ^{SC}	BMDC	—	12.1-in. XGA with antenna	—	Ban 1.4G		
2672-CTx ^{SC}		802.11b (Intel)		DVD-ROM			
2672-CSx ^{SC}	MDC			DVD-RAM/RW			
2884-CWU ^{SC}		802.11b (Cisco)		—			
2672-CXx, 2673-CXx ^{SC}							
2672-CZx ^{SC}	BMDC						
2672-J6x, J7x ^{SC}	MDC	—			Ban 1.4G (GB) ^{*1}		
2672-JAx, JBx ^{SC}		802.11b (Intel)					
2672-JXx ^{SC}		802.11b (Cisco)					
2672-JHx, JJx, 2884-JUx ^{SC}	BMDC	802.11 a/b (IBM)		—			
2672-JVx ^{SC}							
2884-JGx ^{SC}							
X31: memory, 256 MB (PC2700); HDD, 40 GB (4200 rpm)							
2672-H3x	MDC	—	12.1-in. XGA with antenna			—	Ban 1.4G
2672-HBx ^{SC}		802.11b (Intel)					
2672-N3x		—		DVD-ROM	Ban 1.6G		
2672-NPx, NQx							
2884-NRx ^{SC}	802.11b (Intel)	—		Ban 1.6G (GB) ^{*1}			
2672-N6x, N7x, 2673-N7x, 2890-N7x, 2891-N7x ^{SC}					—	Ban 1.6G	
2672-NKx ^{SC}							BMDC
2672-NAx, NBx, NCx ^{SC}	MDC				802.11b (Intel)		
2672-NEx, NFx ^{SC}	BMDC						
2672-NSx ^{SC}	MDC	DVD-ROM					
2672-NTx ^{SC}	BMDC						

(continued)

Model	CDC	Mini PCI adapter	LCD	Bay device for UltraBase	CPU
X31: memory, 256 MB (PC2700); HDD, 40 GB (4200 rpm)					
2672-NZK ^{SC}	BMDC	802.11b (Cisco)	12.1-in. XGA with antenna	—	Ban 1.6G
2672-P7x ^{SC}	MDC	—			Ban 1.6G (GB) ^{*1}
2672-PBx, 2673-PBx ^{SC}		802.11b (Intel)			
2885-PWx ^{SC}				DVD-RAM/RW	
2672-PDx, PEx ^{SC}	BMDC	—			
2672-PXx, 2673-PXx ^{SC}	MDC	802.11b (Cisco)			
2672-PUx ^{SC}		802.11 a/b/g (IBM)			
2672-PHx, PJx ^{SC}	BMDC			—	
2672-PVx ^{SC}		DVD-ROM			
2672-PGx ^{SC}		DVD-RAM/RW			
X31: memory, 512 MB (PC2100); HDD, 40 GB (4200 rpm)					
2672-KVx ^{SC}	BMDC	802.11 a/b (IBM)	12.1-in. XGA with antenna	DVD-ROM	Ban 1.4G (GB) ^{*1}
X31: memory, 512 MB (PC2700); HDD, 40 GB (4200 rpm)					
2672-QVx ^{SC}	BMDC	802.11 a/b/g (IBM)	12.1-in. XGA with antenna	DVD-ROM	Ban 1.6G (GB) ^{*1}
2672-QGx ^{SC}				DVD-RAM/RW	
X31: memory, 512 MB (PC2700); HDD, 40 GB (5400 rpm)					
2672-REx ^{SC}	BMDC	802.11b (Intel)	12.1-in. XGA with antenna	—	Ban 1.6G (GB) ^{*1}
2672-RHx ^{SC}		802.11 a/b/g (IBM)			
2885-RGx ^{SC}					
2672-58x, 2673-58x ^{SC}	MDC	—		—	Ban 1.7G (GB) ^{*1}
2672-5Kx, 2673-5Kx ^{SC}		802.11b (Intel)			
2672-5Ux ^{SC}		802.11 b/g (IBM)			
Tual xxxG: Mobile Intel® Pentium® III processor - M xxx GHz Ban xxxG: Intel® Pentium® M processor xxx GHz SC: featuring security chip *1: featuring Gigabit Ethernet					

Odyssey/Open bay models

Model	CDC	MiniPCI adapter	LCD	Bay device for UltraBase	CPU
X30 (memory, —; HDD, —)					
2672-54x	MDC	—	12.1-in. XGA	—	Tual 1.06 G
2672-5Dx ^{SC}	—	802.11b/modem	12.1-in. XGA with antenna		
2672-64x	MDC	—	12.1-in. XGA		Tual 1.2 G
2672-6Dx ^{SC}	—	802.11b/modem	12.1-in. XGA with antenna		
X31 (memory, —; HDD, —)					
2672-D4x	MDC	—	12.1-in. XGA with antenna	—	Ban 1.3G
2672-D9x ^{SC}					
2672-E4x					Ban 1.4G
2672-E9x ^{SC}					
2672-L9x ^{SC}					Ban 1.4G (GB) * ₁
X31 (memory, —; HDD, —)					
2672-89x ^{SC}	MDC	—	12.1-in. XGA with antenna	—	Ban 1.4G
2672-94J					Ban 1.6G
2672-99x ^{SC}					
2672-A9x ^{SC}					Ban 1.6G (GB) * ₁
2672-A8x ^{SC}	BMDC				
Tual xxxG: Mobile Intel® Pentium® III processor - M xxx GHz Ban xxxG: Intel® Pentium® M processor xxx GHz SC: featuring security chip *1: featuring Gigabit Ethernet					

X31 series Express models

Model	CDC	MiniPCI adapter	LCD	Bay device for UltraBase	CPU
X31: memory, 256 MB (PC2700); HDD, 20 GB (4200 rpm)					
2884-2Nx ^{SC}	MDC	—	12.1-in. XGA with antenna	—	Ban 1.4G
2884-25x ^{SC}				DVD-ROM	
2884-2Wx ^{SC}		802.11b (Intel)		DVD-RAM/RW	
X31: memory, 256 MB (PC2700); HDD, 30 GB (4200 rpm)					
2884-GRx ^{SC}	MDC	802.11b (Intel)	12.1-in. XGA with antenna	—	Ban 1.4G
2884-MRx ^{SC}					Ban 1.6G
X31: memory, 256 MB (PC2700); HDD, 40 GB (4200 rpm)					
2884-NRx ^{SC}	MDC	802.11b (Intel)	12.1-in. XGA with antenna	—	Ban 1.6G (GB) *1
2885-PWx ^{SC}				DVD-RAM/RW	
2885-RGx ^{SC}	BMDC	802.11 a/b (IBM)			
Ban xxxG: Intel® Pentium® M processor xxx GHz SC: featuring security chip *1: featuring Gigabit Ethernet					

X31 series Express Open bay models

Model	CDC	MiniPCI adapter	LCD	Bay device for UltraBase	CPU
X31 (memory, —; HDD, —)					
2884-89x, 2885-89x ^{SC}	MDC	—	12.1-in. XGA with antenna	—	Ban 1.4G
2884-6Wx, 2885-6Wx ^{SC}					Ban 1.5G
2884-6Yx, 2885-6Yx ^{SC}	BMDC				
2884-99x, 2885-99x ^{SC}	MDC			Ban 1.6G	
2884-A9x, 2885-A9x ^{SC}				Ban 1.6G (GB) * ₁	
2884-7Wx ^{SC}				Ban 1.7G (GB) * ₁	
2885-7Zx ^{SC}					DVD-RAM/RW
Ban xxxG: Intel® Pentium® M processor xxx GHz SC: featuring security chip *1: featuring Gigabit Ethernet					

- Each FRU is available for all types or models, unless specific types or models are specified.
- A CRU (customer-replacable unit) is identified by a single asterisk (*) or two asterisks (**) in the CRU ID column. An N in the CRU ID column means that the part is not a CRU. A single asterisk (*) means that the part is a Tier 1 CRU; two asterisks (**) mean that the part is a Tier 2 CRU.

Tier 1 CRU:

(Example: Mouse, external keyboard, and hard disk drive with coin screw)

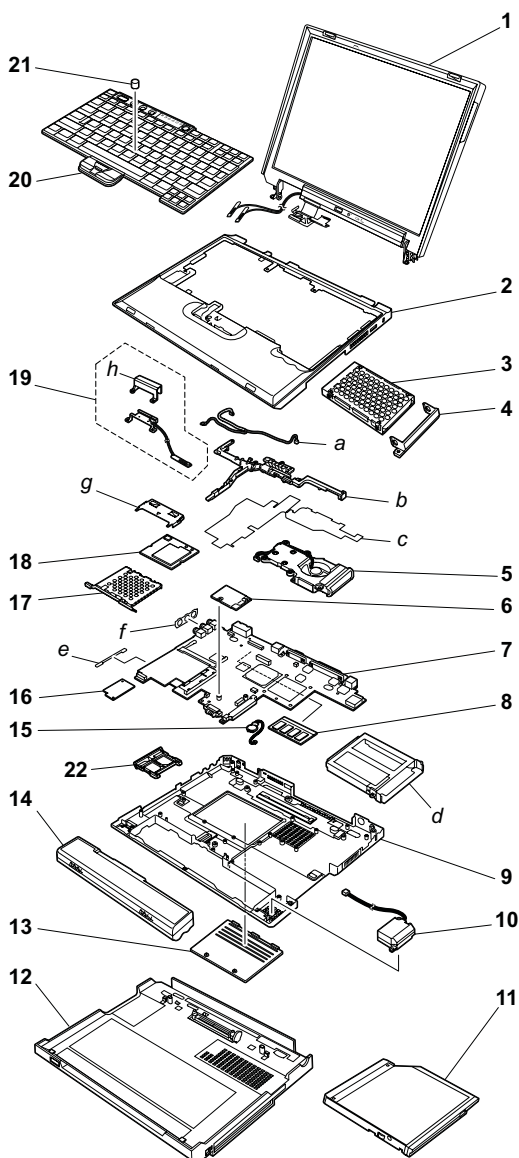
- NO TOOLS ARE REQUIRED.
- A coin or a thumb screw is acceptable.
- Minimal technical expertise is required.
- Minimal problem determination is required—less than 5 minutes.

Tier 2 CRU:

(Example: Adapter card, ThinkPad memory)

- Up to 4 screws or fasteners have to be removed.
- Some technical experience is required.
- HelpCenter assistance may be used.
- Problem determination can be done by the customer, either on site or with HelpCenter assistance.
- FRUs marked with **OP** are available as options.

Overall



No.	FRU	P/N	CRU ID
a-h	See "Miscellaneous parts" on page 177.		
1	LCD unit (see "LCD FRUs" on page 168).		
2	Keyboard bezel assembly for X30 • 2672-11x, 12x, 1Ax, 1Bx, 31x, 32x except 32K, 33x except 33K, 41x, 42x except 42K, 43x except 43K, 45x except 45K, 46x, 47x, 4Ax, 4Bx except 4BK, 4Cx except 4CK, 4Ex except 4EK, 4Gx, 4Hx except 4HK, 4Jx except 4JK, 4Nx, 4Px, 4Qx, 4Rx, 4Sx, 4Tx, 4Vx, 4Xx, 54x, 5Dx, 64x, 6Dx, 76x, 7Mx • 2673-42x except 42K, 4Bx except 4BK	91P9779	N
	Keyboard bezel assembly (Korea) for X30 • 2672-32K, 33K, 42K, 43K, 45K, 4BK, 4CK, 4EK, 4FK, 4HK, 4JK • 2673-42K, 4BK	91P9780	N
	Keyboard bezel assembly for X31 • 2672-B1x, B2x, B3x, BAx, BBx, BCx, BLx, BMx, C1x, C2x, C3x, C6x, C8x, CAx, CBx, CDx, CEx, CFx, CKx, CPx, CQx, CSx, CTx, CXx, CZx, F2x, F3x, FQx, J6x, J7x, JAx, JBx, JHx, JJx, JVx, JXx, KVx • 2672-27x, 2Bx, 89x, 94x, 99x, A8x, A9x, G1x, G2x, G3x, GAx, GBx, GCx, GLx, GMx, H3x, HBx, N7x, NBx, NEx, P7x, PBx, PDx, PEx, PGx, PHx, PJx, PUx, PVx, PXx, QGx, QVx, REx, RHx, N3x, N6x, NAx, NCx, NFx, NKx, NPx, NQx, NSx, NTx, NZx • 2672-39x, 3Lx, 3Ux, 58x, 5Kx, 5Ux • 2673-C2x, CBx, CXx • 2673-N7x, PBx, PXx • 2673-58x, 5Kx • 2884-B5Ux, BNU, BRU, BSU, CRU, CWU, JGU, JUU • 2884-25Ux, 2NU, 2WU, 89U, 99U, A9U, GRx, MRx, NRx • 2885-89U, A8U, A9U, PWU, RGU • 2890-C2x • 2890-N7x • 2891-C2x • 2891-N7x	13N5337	N

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No.	FRU	P/N	CRU ID
3	Hard disk drive (20 GB) 9.5 mm 4200 rpm • 2672-1xx, 31x, 32x, 33x • 2672-Bxx • 2884-Bxx		
	IBM STD OP	27L4286	*
	HITACHI	08K9533	*
	Hard disk drive (20 GB) 9.5 mm 4200 rpm, HGST • 2672-2xx • 2884-2xx	13N6701	*
	Hard disk drive (30 GB) 9.5 mm 4200 rpm • 2672-Gxx • 2672-39x, 3Lx, 3Ux		
	HGST	13N6703	*
	FUJITSU	92P6036	*
	Hard disk drive (40 GB) 9.5 mm 4200 rpm • 2672-4xx, 7xx • 2673-4xx • 2672-Cxx, Fxx, Jxx, Kxx • 2673-Cxx • 2884-Cxx, Jxx		
	IBM STD	08K9683	*
	HITACHI	08K9767	*
	Hard disk drive (40 GB) 9.5 mm 4200 rpm • 2672-Hxx, Nxx, Pxx, Qxx • 2673-Nxx, Pxx		
	HGST	13N6705	*
	FUJITSU	27L4389	*
	IBM STD	92P6332	*
	IBM STD	92P6342	*
	Hard disk drive (40 GB) 9.5 mm 5400 rpm • 2672-Rxx		
	HGST	92P6545	*
	IBM STD	92P6342	*
	Hard disk drive (30 GB) 9.5 mm 4200 rpm, IBM STD • Supported by CTO	92P6330	*
	Hard disk drive (30 GB) 9.5 mm 4200 rpm • Supported by CTO	92P6330	*
	Hard disk drive (60 GB) 9.5 mm 4200 rpm, HGST • Supported by CTO	13N6706	*

(continued)

No.	FRU	P/N	CRU ID
3	Hard disk drive (80 GB) 9.5 mm 4200 rpm, HGST OP • Supported by CTO	13N6708	*
	for optional hard disk drive, see “Optional FRUs” on page 179.		
4	Cover, hard disk drive	13N5450	*
5	Fan assembly for X30	27L6738	N
	Fan assembly for X31	67P1443	N
6	Modem daughter card (MDC) • 2672-11x, 12x, 31x, 32x, 33x, 41x, 42x, 43x, 45x, 46x, 47x, 4Nx, 4Px, 4Qx, 4Xx, 54x, 64x, 76x, 7Mx • 2672-B1x, B2x, B3x, BAx, BBx, BCx, BLx, BMx, C1x, C2x, C3x, C6x, C8x, CAx, CBx, CPx, CQx, CSx, CXx, D4x, D9x, E4x, E9x, F2x, F3x, FQx, J6x, J7x, JAx, JBx, JXx, L9x • 2672-27x, 2Bx, 89x, 94x, 99x, A9x, G1x, G2x, G3x, GAx, GBx, GCx, GLx, GMx, H3x, HBx, N3x, N6x, N7x, NAx, NBx, NCx, NPx, NQx, NSx, P7x, PBx, PUx, PXx • 2672-39x, 3Lx, 3Ux, 58x, 5Kx • 2673-42x • 2673-C2x, CBx, CXx • 2673-N7x, PBx, PXx • 2673-58x, 5Kx • 2884-89x, 99x, A9x, B5Ux, BNU, BRU, BSU, CRU, CWU • 2884-25U, 2Nx, 2WU, GRx, NRx, MRx • 2884-6Wx, 6Yx, 7Wx • 2885-89x, A9x, PWx • 2885-6Wx, 72x • 2890-C2x • 2890-N7x • 2891-C2x • 2891-N7x	91P7657	**
	<i>Bluetooth</i> daughter card (BDC) for X30 series • 2672-4Fx, 4Gx, 4Hx, 4Jx, 4Vx	12P3872	**
	IBM Integrated <i>Bluetooth</i> with 56K Modem (BMDC) for X31 series • 2672-CDx, CEx, CFx, CKx, CTx, CZx, JHx, JJx, JVx, KVx • 2672-A8x, NEx, NFx, NKx, NTx, NZx, PDx, PEx, PGx, PHx, PJx, PVx, QGx, QVx, REx, RHx • 2672-5Ux • 2884-JGU, JUU • 2885-A8x, RGx	91P7315	**

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No.	FRU	P/N	CRU ID
7	System board assembly, Tual NV1.06 G (without security chip, 10/100 Ethernet) • 2672-11x, 12x, 31x, 32x, 33x, 54x, 76x, 7Mx	26P8378	N
	System board assembly, Tual NV1.06 G (with security chip, 10/100 Ethernet) • 2672-1Ax, 1Bx, 5Dx	26P8383	N
	System board assembly, Tual NV1.2 G (without security chip, 10/100 Ethernet) • 2672-41x, 42x, 43x, 45x, 46x, 47x, 4Nx, 4Px, 4Qx, 64x • 2673-42x	26P8379	N
	System board assembly, Tual NV1.2 G (with security chip, 10/100 Ethernet) • 2672-4Ax, 4Bx, 4Cx, 4Ex, 4Fx, 4Gx, 4Hx, 4Jx, 4Rx, 4Sx, 4Tx, 4Vx, 4Xx, 6Dx • 2673-4Bx	26P8384	N
	System board assembly, Intel® Pentium® M processor 1.3 G (without security chip, 10/100 Ethernet) • 2672-B1x, B2x, B3x, BLx, BMx, D4x, F2x, F3x, FQx	26P8527	N
	System board assembly, Intel® Pentium® M processor 1.3 G (with security chip, 10/100 Ethernet) • 2672-BAx, BBx, BCx, D9x • 2884-B5U, BNU, BRU, BSU, CRU, CWU, JGU, JUU • 2890-C2x • 2891-C2x	26P8528	N
	System board assembly, Intel® Pentium® M processor 1.4 G (without security chip, 10/100 Ethernet) • 2672-C1x, C3x, CPx, CQx, E4x	26P8525	N
	System board assembly, Intel® Pentium® M processor 1.4 G (with security chip, 10/100 Ethernet) • 2672-C2x, C6x, C8x, CAx, CBx, CDx, CEx, CFx, CKx, CSx, CTx, CXx, CZx • 2673-C2x, CBx, CXx, E9x • 2884-CRU, CWU	26P8526	N
	System board assembly, Intel® Pentium® M processor 1.4 G (with security chip, Gigabit Ethernet) • 2672-J6x, J7x, JAx, JBx, JHx, JJx, JVx, JXx, KVx, L9x • 2884-JGU, JUU	26P8529	N

(continued)

No.	FRU	P/N	CRU ID
7	System board assembly, Intel® Pentium® M processor 1.4 G (without security chip, 10/100 Ethernet) • 2672-G1x, G2x, G3x, GLx, GMx, H3x • 2884-GRx	91P7391	N
	System board assembly, Intel® Pentium® M processor 1.4 G (with security chip, 10/100 Ethernet) • 2672-27x, 2Bx, 89x, GAx, GBx, GCx, GLx, HBx • 2884-25U, 2NU, 2WU, 89x • 2885-89x	91P7395	N
	System board assembly, Intel® Pentium® M processor 1.5 G (with security chip, 10/100 Ethernet) • 2672-39x, 3Lx, 3Ux • 2884-6Wx, 6Yx • 2885-6Wx	93P4192	N
	System board assembly, Intel® Pentium® M processor 1.6 G (without security chip, 10/100 Ethernet) • 2672-94x, N3x, NPx, NQx • 2884-MRx	91P7343	N
	System board assembly, Intel® Pentium® M processor 1.6 G (with security chip, 10/100 Ethernet) • 2672-99x, N6x, N7x, NAx, NBx, NCx, NEx, NFx, NKx,, NSx, NTx, NZx • 2673-N7x • 2884-99x • 2890-N7x • 2891-N7x	91P7347	N
	System board assembly, Intel® Pentium® M processor 1.6 G (with security chip, Gigabit Ethernet) • 2672-A8x, A9x, P7x, PBx, PDx, PEx, PGx, PHx, PXx, QGx, REx, RHx • 2673-PBx, PJx, PUx, PVx, PXx, QVx • 2884-A9x, NRx • 2885-A8x, A9x, PWx, RGx	91P7351	N
	System board assembly, Intel® Pentium® M processor 1.7 G (with security chip, Gigabit Ethernet) • 2672-58x, 5Kx, 5Ux • 2673-58x, 5Kx • 2884-6Wx • 2885-7Zx	93P4191	N

(continued)

No.	FRU	P/N	CRU ID
8	DIMM card for X30 series		
	128-MB SDRAM SO DIMM (PC133) OP • 2672-1xx	19K4653	*
	256-MB SDRAM SO DIMM (PC133) OP • 2672-31x, 32x, 33x, 4xx, 76x, 7Mx • 2673-4xx	19K4655	*
	DIMM card for X31 series		
	256-MB DDR SDRAM SO DIMM (PC2100) OP • 2672-Bxx, Cxx, Fxx, Jxx • 2673-Cxx • 2884-Bxx, Cxx, Jxx • 2890-Cxx • 2891-Cxx	10K0031	*
	512-MB DDR SDRAM SO DIMM (PC2100) OP • 2672-KVx	10K0033	*
	256-MB DDR SDRAM SO DIMM (PC2700) OP • 2672-2xx, Gxx, Hxx, Nxx, Pxx • 2672-39x, 3Lx, 3Ux, 58x, 5Kx, 5Ux • 2673-Nxx, Pxx • 2673-58x, 5Kx • 2884-2xx, Gxx, Nxx, Mxx • 2885-Pxx • 2890-Nxx • 2891-Nxx	31P9831	*
	512-MB DDR SDRAM SO DIMM (PC2700) OP • 2672-Qxx, Rxx • 2885-Rxx	31P9833	*
	for optional DIMM, see “Optional FRUs” on page 179.		
9	Base cover assembly for 2672 WW (X30) • 2672-x1A, x2A, x5A, x1B, x2B, x3B, x2E, x1F, x2F, x1G, x2G, x1H, x2H, x3H, x1J, x2J, x5J, x1M, x2M, x5M, x1P, x2P, x1S, x2S, x1U, x2U, x4U, x1X, x2X	27L6732	N
	Base cover assembly for 2672 WW (X30) IBM Wireless Mini-PCI • 2672-xAA, xBA, xEA, xBB, xBE, xAF, xBF, xAG, xBG, xAH, xBH, xCH, xAJ, xBJ, xEJ, xAM, xBM, xEM, xAP, xBP, xAS, xBS, xAU, xBU, xDU, xAX, xBX	27L6733	N

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No.	FRU	P/N	CRU ID
9	Base cover assembly for 2672 WW (X30) IBM Wireless Mini-PCI+BT • 2672-4GA, 4HA, 4HF, 4GG, 4HG, 4HH, 4JH, 4HJ, 4HK, 4JK, 4GM, 4HM, 4GP, 4HP, 4GS, 4HS, 4HT, 4JT, 4GU, 4HU, 4GX, 4HX	46P3147	N
	Base cover assembly for 2672 WW (X30) Cisco Wireless Mini-PCI • 2672-4XA, 4XB, 4XE, 4XF, 4XG, 4XH, 4XM, 4XU, 4YA	62P4188	N
	Base cover assembly for 2672 Japan (X30) Cisco Wireless Mini-PCI • 2672-4XJ	62P4189	N
	Base cover assembly for 2672 EMEA (X30) Cisco Wireless Mini-PCI • 2672-4XG	62P4190	N
	Base cover assembly for 2672 Taiwan (X30) • 2672-32T, 33T, 76T, 7MT, 42T, 43T, 46T, 4QT	46P3151	N
	Base cover assembly for 2672 Taiwan (X30) IBM Wireless Mini-PCI • 2672-4BT	46P3152	N
	Base cover assembly for 2672 Taiwan (X30) IBM Wireless Mini-PCI+BT • 2672-4HT, 4JT, 4VT	46P3153	N
	Base cover assembly for 2672 Korea (X30) • 2672-32K, 33K, 42K, 43K, 45K	46P3156	N
	Base cover assembly for 2672 Korea (X30) IBM Wireless Mini-PCI • 2672-4BK, 4CK, 4EK	46P3157	N
	Base cover assembly for 2672 Korea (X30) IBM Wireless Mini-PCI+BT • 2672-4HK, 4JK	46P3158	N
	Base cover assembly for 2672 China (X30) • 2672-33C, 42C, 4NC, 4PC, 4QC	46P3161	N
	Base cover assembly for 2672 China (X30) IBM Wireless Mini-PCI+BT • 2672-4BC, 4RC, 4SC, 4TC, 4VC, 4WC	46P3163	N
	Base cover assembly for 2673 WW (X30) • 2673-42U, 42F, 42P, 42S, 42X, 42G, 42J, 42A, 42H, 42B, 42E, 42M	27L6734	N
	Base cover assembly for 2673 WW (X30) IBM Wireless Mini-PCI • 2673-4BU, 4BF, 4BP, 4BS, 4BX, 4BG, 4BJ, 4BA, 4BH, 4BB, 4BE, 4BM	46P2922	N

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No.	FRU	P/N	CRU ID
9	Base cover assembly for 2673 Taiwan (X30) • 2673-42T	46P3154	N
	Base cover assembly for 2673 Taiwan (X30) IBM Wireless Mini-PCI • 2673-4BT	46P3155	N
	Base cover assembly for 2673 Korea (X30) • 2673-42K	46P3159	N
	Base cover assembly for 2673 Korea (X30) IBM Wireless Mini-PCI • 2673-4BK	46P3160	N
	Base cover assembly for 2673 China (X30) • 2673-42C	46P3164	N
	Base cover assembly for 2673 China (X30) IBM Wireless Mini-PCI • 2673-4BC	46P3165	N
	Base cover assembly for 2672 WW (X31) • 2672-all (except xxK)	67P1427	N
	Base cover assembly for 2672 Korea (X31) • 2672-BxK, CxK, FxK	67P1429	N
	Base cover assembly for 2672 Korea (X31) • 2672-GxK, HxK, NxK, PxK • 2672-58K, 5KK	13N5721	N
	Base cover assembly for 2673 WW (X31) • 2673-Cxx except CxK • 2673-58x except 58K, 5Kx except 5KK	67P1436	N
	Base cover assembly for 2673 Korea (X31) • 2673-CxK	67P1430	N
	Base cover assembly for 2673 Korea (X31) • 2673-NxK, PxK • 2673-58K, 5KK	13N5722	N
	Base cover assembly for 2884 WW (X31) • 2884-BxU, CxU, JxU • 2884-2NU, GRx, MRx, NRx • 2884-6WU, 6YU, 7WU	13N4994	N
	Base cover assembly for 2884 WW (X31) • 2885-PWU, RGU • 2885-6WU, 7ZU	13N4993	N

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No.	FRU	P/N	CRU ID
9	Base cover assembly for 2890 WW (X31) • 2890-C2x except C2K • 2890-N7x except N7K	91P9084	N
	Base cover assembly for 2890 Korea (X31) • 2890-C2K • 2890-N7K	13N5740	N
	Base cover assembly for 2891 (X31) • 2891-C2x except C2K • 2891-N7x except N7K	91P9088	N
	Base cover assembly for 2891 (X31) • 2891-C2K • 2891-N7K	13N5741	N
—	Label kit 802.11b WW • 2672-C2F, CBF, C XF, H2F, HBF, C2P, CBP, CKP, CXP, C2S, CBS, CKS, CXS, C1U, C2U, CAU, CBU, CKU, CXU, H1U, H2U, HAU, HBU, J6U, J7U, JAU, JBU, JXU • 2672-8xU, 9xU, AxU, GxA, GxF, GxH, GxM, GxU, NxA, NxF, NxG, NxH, NxM, NxP, NxS, NxU, NxY, PxA, Px E, PxF, PxG, PxH, PxM, PxP, PxS, PxU, PxY, QxA, RxU • 2673-NxA, NxB, NxF, NxH, NxM, NxP, NxS, NxU, NxY, PxA, PxB, Px E, PxF, PxG, PxH, PxM, PxP, PxS, PxU, PxY • 2884-BRU, CRU • 2885-PWU • 2890-NxA, NxB, NxF, NxG, NxH, NxM, NxP, NxS, NxU, NxY • 2891-NxA, NxB, NxF, NxG, NxH, NxM, NxP, NxS, NxU, NxY	13R2371	N
	Label kit 802.11b China • 2672-B3C, C2C, CBC, CPC, CSC, CXC, H2C • 2672-NxC, PxC, GxC • 2673-N7C, PBC • 2890-N7C • 2891-N7C	67P1432	N
	Label kit 802.11b Korea • 2672-CBK, CFK, CTK • 2672-NxK, PxK, GxK, HxK • 2673-PxK • 2890-N7K • 2891-N7K	67P1431	N

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No.	FRU	P/N	CRU ID
—	Label kit 802.11b Cisco Taiwan • 2672-CXV • 2672-NxV, PxV, GxV, HxV • 2673-N7V, PxV • 2890-N7V • 2891-N7V	67P1438	N
	Label kit 802.11b Actiontec Taiwan • 2672-BAT, BBT, CAT, CBT, CST, HAT, HBT, JAT, JBT	67P1439	N
	Label kit 802.11a/b WW • 2672-JVA, KVA, JHB, JHF, JHG, JJH, JHH, JHM, JHU • 2884-JUU	67P1435	N
	Label kit 802.11a/b China • 2672-JVC	67P1433	N
	Label kit 802.11a/b Japan • 2672-JHJ	67P1434	N
	Label kit 802.11a/b Taiwan • 2672-JVV	67P1440	N
	Label kit (modem only) Taiwan IIPC • 2672-xxV	91P8359	N
	Label kit 802.11a/b/g Japan • 2672-8xJ, 9xJ, AxJ, NxJ, PxJ, GxJ, NxJ, PxJ • 2673-NxE, PxJ, NxJ, PxJ • 2890-NxE, NxJ • 2891-NxE, NxJ	13N8978	N
	Label kit 802.11a/b/g Taiwan IIPC • 2672-PGV, PVV	13N8979	N
10	Speaker assembly	27L6748	N
11	CD-ROM drive, TEAC OP • 2672-7MT • 2672-BLx, BMx • 2672-GLx, GMx	27L3436	*
	DVD drive, MKE OP • 2672-4NC, 4PC, 4QC, 4QT, 4RC, 4SC, 4TC, 4VC, 4VT • 2672-CPx, CQx, CSx, CTx, FQx, JVx, KVx • 2672-NPx, NQx, NSx, NTx, PVx, QVx • 2884-B5U, BSU • 2884-25U	27L4351	*

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No.	FRU	P/N	CRU ID
11	DVD-RAM/RW drive, 12.7 mm (GCC-4240N) • 2672-PGx, QGx, • 2884-CWU, JGU • 2884-2WU • 2885-PWx, RGx • 2885-7ZU	08K9868	*
	for optional Ultrabay devices, see “Optional FRUs” on page 179.		
12	ThinkPad X3 UltraBase OP • 2672-4NC, 4PC, 4QC, 4QT, 4RC, 4SC, 4TC, 4VC, 4VT, 7MT • 2672-BLx, BMx, CPx, CQx, CSx, CTx, FQx, JVx, KVx • 2672-GLx, GMx, NPx, NQx, NSx, NTx, PGx, PVx, QGx, QVx • 2884-B5U, BSU, CWU, JGU • 2884-25U, 2WU • 2884-6YU • 2885-PWx, RGx • 2885-7XU	46L4865	*
—	Security screw • 2672-4NC, 4PC, 4QC, 4QT, 4RC, 4SC, 4TC, 4VC, 4VT, 7MT • 2672-BLx, BMx, CPx, CQx, CSx, CTx, FQx, JVx, KVx • 2672-GLx, GMx, NPx, NQx, NSx, NTx, PGx, PVx, QGx, QVx • 2884-B5U, BSU, CWU, JGU • 2884-25U, 2WU • 2884-6YU • 2885-PWx, RGx • 2885-7XU	62P4279	**
13	Cover, DIMM slot for X30	27L6749	N
	Cover, DIMM slot for X31	67P1452	**
14	Battery pack, Li-ion (6 cell) PANASONIC OP	08K8039	*
	Battery pack, Li-ion (6 cell) SANYO OP	08K8040	*
	for optional battery pack, see “Optional FRUs” on page 179.		
15	Backup battery	02K7078	*

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No.	FRU	P/N	CRU ID
16	IR and 1394 sub card assembly • 2672-1xx, 31x, 32x, 33x, 4xx, 54x, 5Dx, 64x, 6Dx, 76x, 7Mx • 2672-Bxx, Cxx, Dxx, Exx, Fxx, Jxx, KVx, Lxx • 2673-4xx • 2673-Cxx • 2884-Bxx, Cxx, Jxx • 2890-Cxx • 2891-Cxx	26P8215	N
	IR and 1394 sub card assembly • 2672-2xx, 8xx, 9xx, Axx, Gxx, Hxx, Nxx, Pxx, Qxx, Rxx • 2672-3Ux, 58x, 5Kx, 5Ux • 2673-Nxx, Pxx • 2673-58x, 5Kx • 2884-2xx, Gxx, Mxx, Nxx • 2884-6WU, 6YU, 7WU • 2885-8xx, Axx, Pxx, Rxx • 2885-6WU, 7YU • 2890-Nxx • 2891-Nxx	91P7394	N
17	PC card slot	27L6737	N
18	IBM High Rate Wireless LAN Mini-PCI Adapter		
	• 2672-1Ax, 1Bx, 4Ax, 4Bx except 4BC, 4Cx, 4Ex, 4Fx, 4Gx, 4Hx, 4Jx, 4Vx except 4VC, 5Dx, 6Dx • 2673-4Bx except 4BC	91P7215	**
		26P8518	**
	• 2672-4BC, 4RC, 4SC, 4TC, 4VC • 2673-4BC	91P7275	**
	Cisco Aironet Wireless 802.11b		
	• 2672-4XU, 4XF, 4XH, 4XB, 4XM • 2672-CXU, CXF, CXP, CXS, CXY, CXM, CXB, CXH, CXV, JXU • 2673-CXU, CXF, CXP, CXS, CXY, CXM, CXB, CXH, CXV	26P8496	**
	• 2672-PXB, PXF, PXH, PXM, PXP, PXS, PXU, PXV, PXY • 2673-PXB, PXF, PXH, PXM, PXP, PXS, PXU, PXV, PXY	91P7406	**
	• 2672-4XG • 2672-CXA, CXG, CXK, CZG • 2673-CXA, CXG, CXK	26P8498	**
	• 2672-PXA, PXG, PXK, NZK • 2673-PXA, PXG, PXK	91P7408	**
	• 2672-4XJ, 4XE • 2672-CXJ, CXE • 2673-CXJ, CXE	26P8500	**

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No.	FRU	P/N	CRU ID
18	Cisco Aironet Wireless 802.11b		
	• 2672-PXE, PXJ • 2673-PXE, PXJ	91P7410	**
	• 2672-4XC • 2672-CXC • 2673-CXC	26P8502	**
	• 2672-PXC • 2673-PXC	91P7412	**
	Intel® PRO/Wireless LAN 2100 3B Mini PCI Adapter		
	• 2672-BAx, BBx, BCx, C8x, CAx, CBx, CDx, CEx, CFx, CSx, CTx, JAx, JBx • 2672-2Bx, GAx, GBx, GCx, HBx, NAx, NBx, NCx, NEx, NFx, NSx, NTx, PBx, PDx, PEx, REx • 2672-3Lx, 5Lx, 5Ux	91P7143	**
	• 2673-CBx • 2673-PBx • 2673-5Kx • 2884-BRU, BSU, CRU, CWU • 2884-2WU, GRx, MRx, NRx • 2885-PWU	91P7267	**
	IBM Dual-Band 11a/b Wi-Fi Wireless Mini PCI Adapter		
	• 2672-JHx except JHJ, JJx, JVx except JNC, KVx • 2884-JGU, JUU	91P7263	N
		26P8506	N
	• 2672-JHJ	26P8447	N
	• 2672-JVC	91P7265	N
	IBM 11a/b/g Wireless LAN Mini PCI Adapter		
	• 2672-PGx, PHx except PHJ, PJx, PUx, PVx, QGx, QVx, RHx • 2885-RGU	91P7301	**
	• 2672-PHJ	91P7303	**
	IBM 11b/g Wireless LAN Mini PCI Adapter		
	• 2672-3Ux, 5Ux	91P7416	**
19	<i>Bluetooth</i> wireless antenna and hinge cover assembly • 2672-4Fx, 4Gx, 4Hx, 4Jx, 4Vx, • 2672-CDx, CEx, CFx, CKx, CTx, CZx, JHx, JJx, JVx, KVx • 2884-JGIU, JUU	46P2960	N
20	Keyboard* (see “Keyboard” on page 171.)		

(continued)

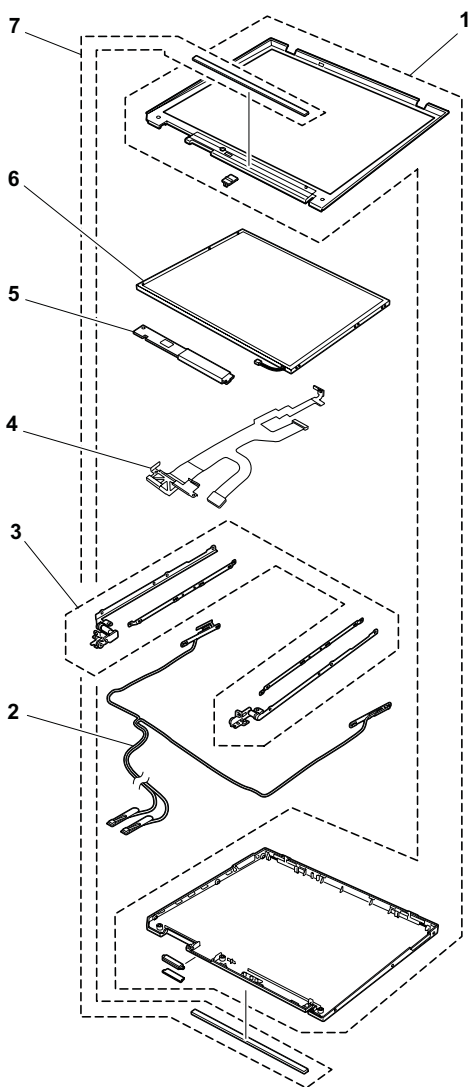
No.	FRU	P/N	CRU ID
21	Pointing stick cap for X30 series	26P9212	*
	Pointing stick caps for X31 series	91P9642	*
22	CompactFlash socket	91P8520	*
—	External diskette drive via USB • 2672-11J, 12J, 1AJ, 1BJ, 31A, 32A, 33C, 41A, 41J, 41M, 43K, 45A, 45J, 45K, 45M, 4AA, 4AJ, 4AM, 4CK, 4EA, 4EJ, 4EK, 4EM, 4FK, 4GA, 4GM, 4HA, 4HK, 4HM, 4JK, 4NC, 4PC, 4QC, 4RC, 4SC, 4TC, 4VC		
	TEAC OP	22P7066	*
	SONY OP	06P5223	*
—	Security screw for ThinkPad X3 UltraBase OP	62P4279	*
—	Telephone cable	27L0700	*
—	Thermal grease	46L4855	N
—	AC adapter OP (see “AC adapters.”)		

AC adapters

FRU	P/N	CRU ID
2-pin, 56 W (models xxE, xxF, xxJ, xxP, xxS, xxU, xxX, xxY)		
DELTA	02K6814	*
LITEON	02K6816	*
3-pin, 56 W (models xxA, xxB, xxC, xxG, xxH, xxK, xxM, xxT, xxV)		
DELTA	02K6813	*
LITEON	02K681	*

LCD FRUs

12.1-in. XGA TFT



No.	FRU	P/N	CRU ID
1	LCD cover kit 12.1-in. for X30 series		
	WW • 2672-11x, 12x, 54x, 31x, 32x, 33x, 36x, 7Mx, 3Kx, 41x, 42x, 43x, 45x, 46x, 4Nx, 4Px, 4Qx, 64x (except xxK) • 2673-42U, 42F, 42P, 42S, 42X, 42T, 42G, 42J, 42A, 42C, 42H, 42B, 42A, 42E, 42M	27L6740	N
	Korea • 2672-32K, 33K, 42K, 43K, 45K • 2673-42K	27L6742	N
	LCD cover kit 12.1-in. with antenna for X30 series		
	WW • 2672-1Ax, 1Bx, 5Dx, 4Ax, 4Bx, 4Cx, 4Ex, 4Rx, 4Sx, 4Tx, 4Yx, 4Xx, 6Dx, 4Gx, 4Hx, 4Jx, 4Vx, 4Wx (except xxK) • 2672-4B7 • 2673-4BU, 4BF, 4BP, 4BS, 4BX, 4BT, 4BG, 4BJ, 4BA, 4BC, 4BH, 4BB, 4BA, 4BE, 4BM	27L6741	N
	Korea • 2672-4BK, 4CK, 4EK, 4HK, 4JK • 2673-4BK	27L6743	N
	10th anniversary model • 2672-4B7	67P1413	N
	LCD cover kit 12.1-in. with antenna for X31		
	WW • 2672-Bxx, Cxx, Dxx, Exx, Fxx, Hxx except xxK • 2672-2xx, 9xx, Axx, Gxx, Nxx, Pxx, Rxx except xxK • 2672-3Ux, 58x except 58K, 5Kx except 5KK, 5Ux • 2673-Cxx except CxK • 2673-Nxx except NxK, Pxx except PxK • 2673-58x except 58K, 5Kx except 5KK • 2884-Bxx, Cxx, Jxx • 2884-2xU, NRx, MRx, GRx • 2884-6Wx, 6Yx, 7Wx • 2885-PWU, RGU • 2885-6Wx, 7Zx • 2890-Cxx except CxK • 2890-Nxx except NxK • 2891-Cxx except CxK • 2891-Nxx except NxK	91P8900	N

(continued)

No.	FRU	P/N	CRU ID
1	LCD cover kit 12.1-in. with antenna for X31		
	Korea • 2672-BxK, CxK, DxK, ExK, FxK, HxK • 2672-GxK, NxK, PxK • 2672-5xK • 2673-CxK • 2673-5xK • 2673-NxK, PxK • 2890-CxK • 2890-NxK • 2891-CxK • 2891-NxK	13N5809	N
2	Antenna assembly for X30 • 2672-1Ax, 1Bx, 5Dx, 4Ax, 4Bx, 4Cx, 4Ex, 4Rx, 4Sx, 4Tx, 4Yx, 4Xx, 6Dx, 4Gx, 4Hx, 4Jx, 4Vx, 4Wx • 2673-4BU, 4BF, 4BP, 4BS, 4BX, 4BT, 4BG, 4BJ, 4BA, 4BC, 4BH, 4BB, 4BK, 4BE, 4BM	27L6745	N
	Antenna assembly for X31 • 2672-CBx, CXx, CHx, CEx, CCx, CSx, CTx, CJx, CVx, CWx, HBx • 2672-9xx, Axx, Gxx, Nxx, Pxx, Rxx • 2672-3xx, 5xx • 2673-CBx, CXx • 2673-Nxx except NxK • 2673-5xx • 2884-Bxx, Cxx • 2890-Cxx • 2890-Nxx • 2891-Cxx • 2891-Nxx	67P1449	N
3	Hinge assembly	27L6744	N
4	LCD cable assembly 12.1 XGA for X30	27L0698	N
	LCD cable assembly 12.1 XGA for X31	08K4090	N
5	Inverter card (AMBIT)	91P7280	N
	Inverter card (AMBIT)	26P8516	N
6	LCD panel, 12.1 XGA (LG)	11P8224	N
	LCD panel, 12.1 XGA (DBU)	11P8225	N
7	Clear plate for X30	46P3171	N
	Clear plate for X31	67P1448	N

Keyboard

Language	P/N for X30	P/N for X31	CRU ID
Arabic	02K6162	08K5094	**
Belgian	02K6157	08K5089	
Chinese, Traditional	02K6159	08K5091	
Czech	02K6163	08K5095	
Danish	02K6150	08K5082	
Dutch	02K6147	08K5079	
English, U.K.	02K6141	08K5075	
English, U.S.	02K6139	08K5073	
French, Canadian	02K6144	08K5076	
French, Canadian 058	—	93P4747	
French, European	02K6146	08K5078	
German	02K6145	08K5077	
Greek	02K6165	08K5097	
Hungarian	02K6164	08K5096	
Hebrew	02K6161	93P4708	
Italian	02K6151	08K5083	
Japanese	02K6140	08K5074	
Korean	02K6156	08K5088	
Norwegian	02K6149	08K5081	
Polish	02K6167	08K5099	
Portuguese	02K6154	08K5086	
Russian	02K6160	08K5092	
Slovak	02K6166	08K5098	
Slovenian	02K6168	08K5100	
Spanish, European	02K6155	08K5087	
Spanish, Latin American	02K6152	08K5084	
Swedish or Finnish	02K6148	08K5080	
Swiss	02K6153	08K5085	
Thai	—	93P4723	
Turkish	02K6158	08K5090	

Recovery CDs

For Windows 2000 (X30)

Windows 2000 is preinstalled as the operating system in following models:

- 2672-11x, 1Ax, 31x, 41x, 4Ax, 4Gx, 4Nx, and 4Rx

Language	P/N	CRU ID
Arabic	01R5493	*
Chinese, Simplified	67P4609	
Chinese, Traditional	67P4606	
Chinese, Traditional (Hong Kong S.A.R.)	67P4612	
Czech	01R5494	
Danish	01R5484	
Dutch	01R5491	
English, U.K.	01R5482	
English, U.S.	01R6193	
Finnish	01R5490	
French	01R5485	
German	01R5486	
Greek	01R5498	
Hebrew	01R5495	
Hungarian	01R5499	
Italian	01R5489	
Japanese	01R6865	
Norwegian	01R5492	
Polish	01R5496	
Portuguese	01R5483	
Russian	01R5500	
Spanish	01R5487	
Swedish	01R5488	
Turkish	01R5497	

For Windows XP Professional (X30)

Windows XP Professional is preinstalled as the operating system in following models:

- 2672-12x, 1Bx, 32x, 42x, 45x, 46x, 47x, 4Bx, 4Ex, 4Hx, 4Px, 4Sx, 4Vx, 4Xx, 76x
- 2673-42x and 4Bx

Language	P/N	CRU ID
Arabic	01R5553	*
Chinese, Simplified	67P4611	
Chinese, Traditional	67P4608	
Chinese, Traditional (Hong Kong S.A.R.)	67P4614	
Czech	01R5554	
Danish	01R5544	
Dutch	01R5551	
English, U.K.	01R5542	
English, U.S.	01R6196	
Finnish	01R5550	
French	01R5545	
German	01R5546	
Greek	01R5558	
Hebrew	01R5555	
Hungarian	01R5559	
Italian	01R5549	
Japanese	62P8901	
Norwegian	01R5552	
Polish	01R5556	
Portuguese	01R5543	
Russian	01R5560	
Spanish	01R5547	
Swedish	01R5548	
Turkish	01R5557	

For Windows XP Home Edition (X30)

Windows XP Home Edition is preinstalled as the operating system in following models:

- 2672-33x, 43x, 4Cx, 4Fx, 4Jx, 4Qx, 4Tx, and 7Mx

Language	P/N	CRU ID
Chinese, Simplified	67P4610	*
Chinese, Traditional	67P4607	
Chinese, Traditional (Hong Kong S.A.R.)	67P4613	
English, AP	01R6199	

For Windows 2000 (X31)

Windows 2000 is preinstalled as the operating system in following models:

- 2672-B1x, BAx, C1x, C6x, CAx, CDx, J6x, and JAx

Language	P/N	CRU ID
Arabic	01R7327	*
Czech	01R7328	
Danish	01R7318	
Dutch	01R7325	
English, U.K.	01R7316	
English, U.S.	01R8226	
Finnish	01R7324	
French	01R7319	
German	01R7320	
Greek	01R7332	
Hebrew	01R7329	
Hungarian	01R7333	
Italian	01R7323	
Japanese	01R8304	
Norwegian	01R7326	
Polish	01R7330	
Portuguese	01R7317	
Russian	01R7334	
Spanish	01R7321	
Swedish	01R7322	
Turkish	01R7331	

For the following models, use the recovery CD listed below:

- 2672-G1J, GAJ, N6J, and NAJ

Language	P/N	CRU ID
Japanese	01R8304	*

For Windows XP Professional (X31)

Windows XP Professional is preinstalled as the operating system in following models:

- 2672-B2x, BBx, BLx, C2x, C8x, CBx, CEx, CKx, CPx, CSx, CXx, CZx, F2x, J7x, JBx, JHx, JVx, JXx, and KVx
- 2672-27x, 2Bx, G2x, GBx, HBx, N7x, NBx, NEx, NKx, NPx, NSx, NZx, P7x, PBx, PDx, PEx, PGx, PHx, PUx, PVx, PXx, QGx, QVx, REx, and RHx
- 2672-3Ux, 58x, 5Kx, and 5Ux
- 2673-C2x, CBx, and CXx
- 2673-N7x, PBx, and PXx
- 2673-58x and 5Kx
- 2884-B5x, BNx, BRx, BSx, CRx, CWx, Jux, and JGx
- 2884-25x, 2Nx, 2Wx, GRx, MRx, and NRx
- 2884-6Wx, 6Yx, and 7Wx
- 2885-PWx and RGx
- 2885-6Wx and 7Zx
- 2890-C2x
- 2890-N7x
- 2891-C2x
- 2891-N7x

Language	P/N	CRU ID
Arabic	24R3269	*
Chinese, Simplified	24R3262	
Chinese, Traditional	24R3263	
Chinese, Traditional (Hong Kong S.A.R.)	24R3264	
Czech	24R3268	
Danish	24R3258	
Dutch	24R3261	
English, U.K.	24R3391	
English, U.S.	24R3251	
Finnish	24R3259	
French	24R3252	
German	24R3253	

(continued)

Language	P/N	CRU ID
Greek	24R3273	*
Hebrew	24R3266	
Hungarian	24R3272	
Italian	24R3255	
Japanese	24R3265	
Norwegian	24R3260	
Polish	24R3267	
Portuguese	24R3256	
Russian	24R3270	
Spanish	24R3254	
Swedish	24R3257	
Turkish	24R3271	

For Windows XP Home Edition (X31)

Windows XP Home Edition is preinstalled as the operating system in following models:

- 2672-B3x, BCx, BMx, C3x, CFx, CTx, CQx, F3x, FQx, and JJx
- 2672-G3x, GCx, GMx, H3x, PJx, N3x, NCx, NFx, NQx, and NTx

Language	P/N	CRU ID
Chinese, Simplified	24R3367	*
Chinese, Traditional	24R3368	
Chinese, Traditional (Hong Kong S.A.R.)	24R3369	
English, AP	24R3366	
Japanese	24R3370	

Miscellaneous parts

FRU	P/N	CRU ID
Screw kit (including nylon-coated screws): • M2 x 4 mm, flat head (30) • M2 x 3 mm, flat head (25) • M2.5 x 4.8 mm, flat head (15) • M2 x 13.5 mm, pan head (10) • M2 x 9.5 mm, flat head (20) • M2 x 6 mm, flat head (20) • M3 x 2.8 mm, flat head (25) • M2 x 14 pan head with washer (5) • HDD M3 x 4 (10) • M2 x 3 mm, TR7 (1) • Hex stud, D-sub (10) • Screw caps (painted) • Screw caps (not painted)	27L6751	N
Base miscellaneous parts for X30: • Lid, docking (front) • Lid, docking (rear) • Spring, docking lid • Rubber foot • 5th rubber foot • EMI plate, docking • Holder, docking • Latch, battery lock • Holder, battery lock • Spring, battery lock • EMI finger, front • Fan spacer • IR/1394 cover • Screw caps	27L6735	N
Base miscellaneous parts for X31: • Lid, docking (front) • Lid, docking (rear) • Spring, docking lid • Rubber foot • 5th rubber foot • Fan outlet cover • EMI plate, docking • Holder, docking • Latch, battery lock • Holder, battery lock • Spring, battery lock • EMI finger, front • Fan spacer • IR/1394 cover • (22) CompactFlash dummy socket • Screw caps Note: Bold number in parentheses is references to the exploded view on page 153.	67P1453	N

(continued)

FRU	P/N	CRU ID
System miscellaneous parts for X30: • (a) Cable, RJ11 to system board docking • (b) Cable guide • (c) Keyboard CRU insulator • (d) Hard-disk holder • (e) PC Card guide • (h) Hinge cover • Easy button cover • (f) Retainer, audio connector • Screw caps Note: Italicized letters in parentheses are references to the exploded view on page 153.	27L6739	N
System miscellaneous parts for X31: • (a) Cable, RJ11 to system board docking • (b) Cable guide • (d) Hard-disk holder • (e) PC Card guide • (h) Hinge cover • Easy button cover • (f) Retainer, audio connector without plating • Bracket, MiniPCI 802.11a/b with tamper-proof screw • Screw caps Note: Italicized letters in parentheses are references to the exploded view on page 153.	13N5449	N
System board miscellaneous parts for X30: • I/O plate	27L6736	N
System board miscellaneous parts for X31: • I/O plate • Studs, system board • EMI shield, audio USB • Hex studs, D-sub • Latch, keyboard stud • Docking insulator • EMI sheet • Thermal rubber • EMI tape, CompactFlash socket	67P1442	N

Optional FRUs

FRU	P/N	CRU ID
64-MB SDRAM SO DIMM (PC133) (for X30 series)	19K4651	*
512-MB SDRAM SO DIMM (PC133) (for X30 series)	19K4657	*
128-MB DDR SDRAM SO DIMM (PC2100) (for models -Bxx, Cxx, Fxx, Jxx, Kxx in X31 series)	10K0029	*
128-MB DDR SDRAM SO DIMM (PC2700) (for models -Gxx, Hxx, Nxx, Pxx, Qxx, Rxx in X31 series)	31P9829	*
1-GB DDR SDRAM SO DIMM (PC2700) (for models -Gxx, Hxx, Nxx, Pxx, Qxx, Rxx in X31 series)	31P9835	*
Hard disk drive (40 GB) 9.5 mm 5400 rpm, IBM STD	27L4384	*
Hard disk drive (60 GB) 12.5 mm 5400 rpm, IBM STD	08K9700	*
Hard disk drive (60 GB) 9.5 mm 4200 rpm, HITACHI	08K9833	*
AC adapter 2-pin (72 W) (for models models xxE, xxF, xxJ, xxP, xxS, xxU, xxX)		*
ASTEC	02K6756	
DELTA	02K6753	
SANKEN	02K6757	
AC adapter 3-pin (72W) (for models models xxA, xxB, xxC, xxG, xxH, xxK, xxM, xxT)		*
ASTEC	02K6751	
DELTA	02K6754	
Extended life battery pack (6 cell) SANYO (for models xxA, xxB, xxC, xxF, xxG, xxH, xxK, xxM, xxP, xxS, xxT, xxU, xxX)	02K7043	*
Extended life battery pack (6 cell) SANYO (for models xxE, xxJ)	02K7046	*
UltraPort camera	02K5153	*
UltraPort adapter and connector cover	08K6105	**
USB cable attachment	08K6108	*
USB cable	27L0542	*
Bluetooth UltraPort module	09N9813	*
ThinkPad Dock with extension plate	08N1537	N
ThinkPad Dock PCI cover	08N7317	N
ThinkPad Dock top cover and screw kit	12P4143	N

(continued)

FRU	P/N	CRU ID
ThinkPad Dock II	67P9010	*
ThinkPad Dock II top cover and screw kit	46P3085	N
ThinkPad Port Replicator	08N1536	N
ThinkPad Mini Dock	67P9011	*
ThinkPad Mini Dock AC adapter (2 pin, 120 W)		*
DELTA	02K7086	
LITEON	02K7092	
ThinkPad Mini Dock AC adapter (3 pin, 120 W)		*
DELTA	02K7094	
LITEON	02K7096	
ThinkPad Port Replicator II	74P6735	*
Multiple battery charger	02K6642	*
Diskette drive (TEAC)	08K9606	*
Diskette drive (SONY)	08K9607	*
DVD/CD-RW combo drive (HLDS)	08K9820	*
SuperDisk drive (LS240)	08K9615	*
ZIP-250 drive	22P9115	*
2nd HDD adapter	08K6067	*
Ultrabay 2000 battery, Li-Ion (SANYO) (for models xxA, xxB, xxC, xxF, xxG, xxH, xxK, xxM, xxP, xxS, xxT, xxU, xxX)	02K6817	*
Ultrabay 2000 battery, Li-Ion (SANYO) (for models xxE, xxJ)	02K6818	*
Ultrabay Plus device carrier	26P9388	*
Ultrabay Plus numeric keypad	19K2056	*
Ultrabay Plus cradle for WorkPad c500 series	26P9389	*

Common parts list

Tools

Tool	P/N
Triconnector wrap plug	72X8546
PC test card	35G4703
Audio wrap cable	66G5180
USB parallel test cable	05K2580
Screwdriver kit	95F3598
Torque screwdriver	05K4695
5 mm socket wrench	05K4694
Screwdriver	27L8126
1/4" drive spinner handle	1650840
1/4" Sq. to 1/4" hex torx adapter	93F2838
TR7-TR-10 tamper resistant torx bits	00P6967
ThinkPad Hardware Maintenance Diskette Version 1.70 Note: Download the file from the following Web site: http://www.ibm.com/pc/partner/infotips	—

Power cords (system)

An IBM power cord for a specific country or region is usually available only in that country or region:

For 2-pin power cords:

Region	P/N	CRU ID
Canada, U.S.	13H5264	*
Japan	74P4331	
Argentina	36L8870	
Brazil	49P2095	

For 3-pin power cords:

Region	P/N	CRU ID
Australia, New Zealand	76H3514	*
Taiwan, Thailand	76H3516	
Italy	76H3530	
Denmark	76H3520	
U.K., China (Hong Kong S.A.R.)	76H3524	
European countries	76H3518	
India, South Africa	76H3522	
Israel	76H3532	
Korea	76H3535	
China (P.R.C.) (other than Hong Kong S.A.R.)	02K0539	
Switzerland	76H3528	

Power cords (ThinkPad Dock and ThinkPad Dock II)

An IBM power cord for a specific country or region is usually available only in that country or region:

For 3-pin power cords:

Region	P/N	CRU ID
Argentina	36L8868	*
Australia, New Zealand	75H8988	
Brazil	49P2101	
Canada, Thailand, U.S.	75H8989	
Denmark	75H8992	
European countries	75H8990	
India, South Africa	75H8993	
Israel	75H8999	
Italy	75H8998	
Japan	75H8996	
Korea	76H3536	
China (P.R.C.) (other than Hong Kong S.A.R.)	02K0540	
Switzerland	75H8997	
U.K.	75H8994	

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Part Number: 13N6342

(1P) P/N: 13N6342

